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New records and detailed distribution and abundance of selected arthropod species collected between 1999 and 2011 in Azorean native forests

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Abstract

Background

In this contribution we present detailed distribution and abundance data for arthropod species identified during the [BALA](#) – *Biodiversity of Arthropods from the Laurisilva of the Azores* (1999-2004) and [BALA2](#) projects (2010-2011) from 18 native forest fragments in seven of the nine Azorean islands (all excluding Graciosa and Corvo islands, which have no native forest left).

New information

Of the total 286 species identified, 81% were captured between 1999 and 2000, a period during which only 39% of all the samples were collected. On average, arthropod richness for each island increased by 10% during the time frame of these projects. The classes Arachnida, Chilopoda and Diplopoda represent the most remarkable cases of new island records, with more than 30% of the records being novelties. This study stresses the need to expand the approaches applied in these projects to other habitats in the Azores, and more importantly to other less surveyed taxonomic groups (e.g. Diptera and Hymenoptera). These steps are fundamental for getting a more accurate assessment of biodiversity in the archipelago.

Keywords

Azores; terrestrial arthropods; BALA project; laurissilva forest; Linnean, Wallacean and Prestonian shortfalls.

Introduction

In 1999 a group of researchers from the University of the Azores and the University of Lisbon started a long-term (1999-2004) standardized sampling program to inventory the arthropod biodiversity in native forest remnants of the Azores - the [BALA I](#) project – *Biodiversity of Arthropods from the Laurisilva of the Azores* (Borges et al. 2000, Borges et al. 2005a, Borges et al. 2011, Ribeiro et al. 2005, Gaspar et al. 2008). More recently, this project was extended by researchers from the Universities of the Azores, Athens and Oxford, by surveying part of the same native forest plots almost 10 years later - [BALA II](#) project (2010-2011).

Eight years of standardized survey of the native forest in seven of the nine Azorean islands resulted in a major improvement on the knowledge of the Azorean arthropod fauna, in particular concerning Araneae, Opiliones, Pseudoscorpionida, Diplopoda, Chilopoda and Insecta (excluding Collembola, Diptera and Hymenoptera). As a consequence, several new endemic taxa were described for the archipelago (e.g. Blas and Borges 1999, Ribes and Borges 2001, Platia and Borges 2002, Quartau and Borges 2003, Borges et al. 2004, Borges and Wunderlich 2008, Crespo et al. 2013, Crespo et al. 2014) or are in the process of being described (Borges et al. 2016 in press). In fact, after examining the shape and characteristics of discovery curves, Lobo and Borges (2010) clearly show that it is very likely that many new species of arthropods remain to be discovered in the Azores particularly for less studied groups in this archipelago such as Diptera and Hymenoptera. Besides purely faunistic results, the BALA data was also used to evaluate abundance, spatial variance and occupancy of arthropods (Gaston et al. 2006, Rigal et al. 2013), the effects of disturbance and biotic integrity of the native forests on arthropod assemblages (Cardoso et al. 2007, Cardoso et al. 2013, Gaspar et al. 2011, Florencio et al. 2013, Florencio et al. 2015), the extinction debt of Azorean forest specialist species (Triantis et al. 2010) and the performance of species richness estimators (Hortal et al. 2006). Moreover, such data allowed the ranking of conservation priorities for the fauna and flora of the Azores (e.g. Borges et al. 2005a, Martín et al. 2010) and allowed the estimation of extinction debt in Azores (Terzopoulou et al. 2015, Triantis et al. 2010).

During this period, two complete checklists of Azorean arthropod fauna were produced (Borges et al. 2005b, Borges et al. 2010), which included the distribution of each species per island. In this paper we compile and synthesize the faunistic results of both [BALA](#) projects, highlighting novel distribution records and presenting not only detailed distribution but also abundance data for each species, adding taxonomical and biogeographical information whenever possible. Finally, we provide a general and updated overview on the diversity of the Azorean arthropods.

Materials and methods

Area of study: The Azores

The remote Azores archipelago extends for 615 km in the North Atlantic Ocean (37-40 °N, 25-31 °W), 1584 km to the east (southern Europe) and 2150 km to the west (northern America) of the nearest mainland. It comprises nine main islands and some small islets, all of volcanic origin, and is located at the triple junction of the Eurasian, African and American tectonic plates. The nine islands are divided into three groups: the western group (Corvo and Flores isls.), the central group (Faial, Pico, Graciosa, São Jorge and Terceira isls.), and the eastern group (São Miguel and Santa Maria isls) (Fig. 1). The climate is temperate and oceanic, strongly influenced by the ocean and island topography, which together produce high relative atmospheric humidity, above 95% on average on native forests.

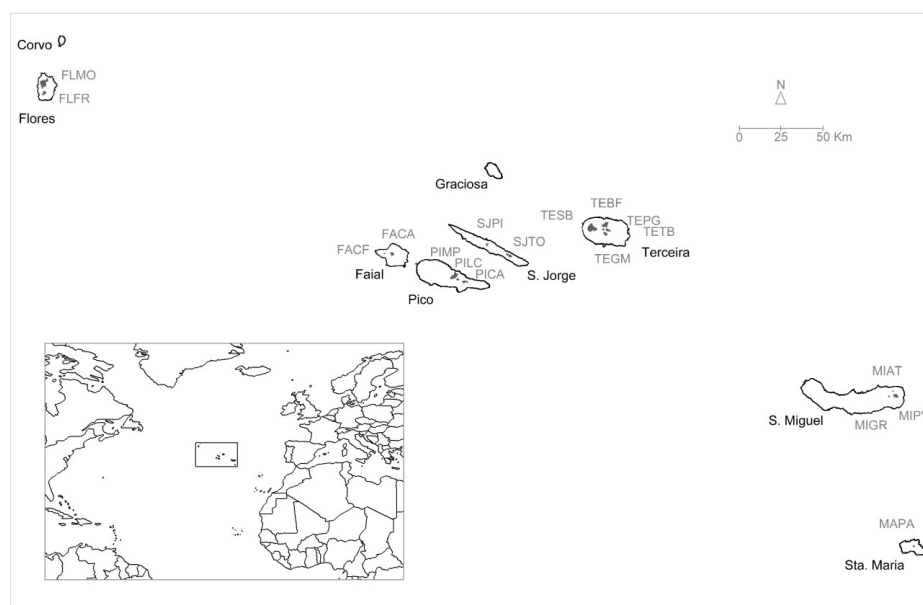


Figure 1.

Location of the Azores and of native forest fragments in the archipelago. Codes for forest fragments as in Table 1.

Sampling protocol

Eighteen native forest fragments distributed across seven of the nine islands were sampled (Table 1; see also Gaspar et al. 2008). Graciosa and Corvo islands were excluded as they no longer present native forest. Human settlement in the Azores lead to considerable native forest destruction which has left the entire archipelago with little over 2% of the original forest cover. During the summer (June to September) 150 m long and 5 m wide transects were set up in 100 sites from 1999 to 2004 ([BALA I](#): 18 native forest fragments)

and some were sampled twice in that period totalling 123 samples; about 29 of those sites were resampled from 2010 to 2011 using the same protocol ([BALA II](#) project; 15 native forest fragments). Along each transect, arthropods from the soil (mainly epigeal) and herbaceous vegetation were surveyed with pitfall traps, while arthropods from woody plants were sampled using a beating tray. Pitfall traps consisted of plastic cups with 4.2 cm diameter and 7.8 cm height. Thirty pitfall traps were set up per transect. Half of the traps were filled with a non-attractive ethylene glycol preservative solution (antifreeze solution), and the remaining with a general attractive solution, a modified version of Turquin (Turquin 1973) prepared mainly with dark beer and preservative agents. A few drops of dishwashing liquid were added to both solutions to reduce surface tension. Traps were sunk in the soil (cup rim at surface level) every 5 m along the transects, those filled with Turquin alternating with traps containing antifreeze solution. Traps were protected from rain using a plastic plate, placed about 5 cm above surface level and fixed to the ground by two pieces of wire. Accidental collection of small vertebrates and damage by rodents was prevented using a piece of plastic mesh placed on top of the trap and fixed to the ground by pieces of wire. The traps remained active in the field for two weeks.

Table 1.

Main characteristics of the Azorean islands (bold) and native forest fragments sampled from 1999 to 2011, including area (hectares), highest point (altitude in metres), distance to the nearest island/fragment (isolation in kilometres) and the oldest geological age of emerged substrate (million years BP) (adapted from Gaspar et al. 2008).

Island	Fragment	Code	Area (ha)	Altitude (m)	Isolation (km)	Age (my)
Flores		FLO	14102	911	236.43	2.16
	Morro Alto e Pico da Sé	MO	1331	911	6.02	2.16
	Caldeiras Funda e Rasa	FR	240	773	6.02	2.16
Faial		FAI	17306	1043	34.26	0.73
	Caldeira do Faial	CA	190	934	4.67	0.73
	Cabeço do Fogo	CG	36	597	4.67	0.60
Pico		PIC	44498	2350	32.42	0.30
	Mistério da Prainha	MP	689	881	2.92	0.26
	Caveiro	CA	184	1077	4.61	0.27
	Lagoa do Caiado	LC	79	945	2.92	0.28
São Jorge		SJG	24365	1053	32.42	0.55
	Topo	TO	220	946	15.13	0.55
	Pico Pinheiro	PP	73	717	15.13	0.55
Terceira		TER	40030	1021	71.67	3.52
	S. Bárbara e M. Negros	SB	1347	1021	7.20	1.24
	Biscoito da Ferraria	BF	557	809	3.03	0.10
	Guilherme Moniz	GM	223	487	2.70	0.41

	Terra Brava	TB	180	726	2.70	0.10
	Pico do Galhardo	PG	38	655	2.79	0.10
São Miguel		SMG	74456	1105	97.53	4.01
	Pico da Vara	PV	306	1105	3.42	3.20
	Graminhais	GR	15	930	4.02	3.20
	Atalhada	AT	10	500	3.42	4.01

Canopy sampling was conducted during the trapping period, when the vegetation was dry. A 5 m wide square was established every 15 m (total of 10 squares per transect). Two woody plant specimens of the most abundant species (up to three species when available) were sampled in each square. For each selected plant, a branch was chosen at random and a beating tray placed beneath. The tray consisted of a 1 m wide and 60 cm deep cloth inverted pyramid, with a plastic bag at the vertex. Five beatings were made using a stick for each plant individual sampled.

The arthropod taxa considered in this study were selected based on the availability of expert taxonomists and ability to readily separate them by morphological criteria. All Araneae, Opiliones, Pseudoscorpionida, Diplopoda, Chilopoda and Insecta (excluding Collembola, Diptera and Hymenoptera) were assigned to morphospecies through comparison with a reference collection. Various taxonomists (PAVB, ARMS, LC, PC, HE, FI, VM, MTP, JR, AB, ABS, RzS, VV, JW, JAQ, and see also Acknowledgments) checked the assignment to morphospecies, performed species identifications and supplied additional ecological information. The taxonomic nomenclature follows the most recent list of Azorean arthropods (Borges et al. 2010).

All specimens are deposited in the Entomological Collection Dalberto Teixeira Pombo at the University of the Azores (Portugal), under the curation of Paulo A. V. Borges (pborges@uac.pt).

In this contribution we list the 286 species for which we obtained an identification. The new records for each island are marked with *. For this list two families of Coleoptera were not considered since they will be presented elsewhere, Staphylinidae (Borges et al. in prep.) and Zopheridae (Borges et al. 2016). For detailed maps on the distribution of these species in Azores consult the [Azores Bioportal](#).

All specimens were assigned a SITE CODE composed of several letters and numbers that read as follows (see Suppl. material 1 for complete data). Detailed metadata is given in Suppl. material 2):

i) the first three letters refer to island name (FLO – Flores; FAI – Faial; PIC – Pico; SJG – São Jorge; GRA – Graciosa; TER – Terceira; SMG – São Miguel; SMR – Santa Maria);

ii) the following two letters refer to fragment name (Flores: FR - Caldeiras Funda e Rasa, MA - Morro Alto e Pico da Sé; Faial: CF – Caldeira do Faial, CG – Cabeço do Fogo; Pico: CA – Caveiro, LC – Lagoa do Caiado, MP – Mistério da Prainha; São Jorge: PP – Pico

Pinheiro, TO – Topo; Terceira: BF – Biscoito da Ferraria, GM – Caldeira do Guilherme Moniz, PG – Pico do Galhardo, SB – Serra de Santa Bárbara, TB – Terra Brava; São Miguel: AT – Atalhada, GR – Graminhais, PV – Pico da Vara; Santa Maria: PA – Pico Alto);

iii) the following three characters refer to the sampling transect; and

iv) the next letter refers to the sampling technique: P - pitfall, B - canopy beating; for pitfall samples (P) TU – Turquin and ET – ethylene glycol; for canopy samples (B) the next two letters refer to the plant sampled: CA = *Calluna vulgaris*, CL = *Clethra arborea*, ER = *Erica azorica*, FR = *Frangula azorica*, IL = *Ilex perado azorica*, JU = *Juniperus brevifolia*, LA = *Laurus azorica*, MC = *Morella faya*, MS = *Myrsine africana*, PI = *Picconia azorica*, PT = *Pittosporum undulatum*, VA = *Vaccinium cylindraceum*.

For the geographical location of transects within reserves (UTM coordinates) see Suppl. material 3.

Accumulation curves were obtained using the software “[Species Diversity and Richness](#)” V.4.

Checklist of the Studied Azorean Arthropods

Kingdom Animalia

Phylum Arthropoda

Class Arachnida

Order Pseudoscorpiones

Family Chthoniidae

***Chthonius ischnocheles* (Hermann, 1804)**

- <http://azoresbioportal.uac.pt/azores-species/chthonius-ischnocheles-10257/>

Native status: Introduced

Distribution: COR; FLO*; FAI; PIC; GRA; SJG*; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Western Palearctic)

***Chthonius tetrachelatus* (Preyssler, 1790)**

- <http://azoresbiportal.uac.pt/azores-species/chthonius-tetrachelatus-10380/>

Native status: Introduced

Distribution: COR; FLO*; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Western Palearctic)

Family Neobisiidae***Neobisium maroccanum* Beier, 1930**

- <http://azoresbiportal.uac.pt/azores-species/neobisium-maroccanum-10482/>

Native status: Introduced

Distribution: FLO; FAI; PIC; GRA; SJG*; TER*

Notes: Biogeographical Realm: Palearctic

Order Opiliones**Family Phalangidae*****Homalenotus coriaceus* (Simon, 1879)**

- <http://azoresbiportal.uac.pt/azores-species/homalenotus-coriaceus-8096/>

Native status: Native

Distribution: FLO*; FAI*; PIC*; TER*; SMG; SMR*

Notes: Biogeographical Realm: Palearctic

***Leiobunum blackwalli* Meade, 1861**

- <http://azoresbiportal.uac.pt/azores-species/leiobunum-blackwalli-7831/>

Native status: Native

Distribution: FLO*; FAI*; PIC*; GRA; SJG*; TER*; SMG*

Notes: Biogeographical Realm: Western Palearctic

Order Araneae

Family Araneidae

Gibbaranea occidentalis Wunderlich, 1989

- <http://azoresbiportal.uac.pt/azores-species/gibbaranea-occidentalis-6895/>

Native status: Azores endemic

Distribution: FLO; FAI; PIC*; GRA; SJG*; TER*; SMG; SMR

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

Mangora acalypha (Walckenaer, 1802)

- <http://azoresbiportal.uac.pt/azores-species/mangora-acalypha-7972/>

Native status: Introduced

Distribution: FLO; FAI; PIC; GRA; SJG*; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Western Palearctic)

Family Clubionidae

Cheiracanthium erraticum (Walckenaer, 1802)

- <http://azoresbiportal.uac.pt/azores-species/cheiracanthium-erraticum-6898/>

Native status: Introduced

Distribution: FLO; FAI*; PIC*; GRA; SJG*; TER; SMG; SMR*

Notes: Biogeographical Realm: Palearctic

Cheiracanthium floresense Wunderlich, 2008

- <http://azoresbiportal.uac.pt/azores-species/cheiracanthium-floresense-7719/>

Native status: Azores endemic

Distribution: FLO*

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

***Cheiracanthium jorgeense* Wunderlich, 2008**

- <http://azoresbiportal.uac.pt/azores-species/cheiracanthium-jorgeense-7720/>

Native status: Azores endemic

Distribution: SJG*

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

***Clubiona decora* Blackwall, 1859**

- <http://azoresbiportal.uac.pt/azores-species/clubiona-decora-7726/>

Native status: Native

Distribution: COR; FLO*; FAI*; PIC*; GRA; SJG*; TER; SMG*; SMR*

Notes: Also present: MAD; CAN (Biogeographical Realm: Western Palearctic)

***Clubiona genevensis* L. Koch, 1866**

- <http://azoresbiportal.uac.pt/azores-species/clubiona-genevensis-7717/>

Native status: Introduced

Distribution: FAI; PIC*; GRA; TER; SMG; SMR

Notes: Biogeographical Realm: Palearctic

***Clubiona terrestris* Westring, 1851**

- <http://azoresbiportal.uac.pt/azores-species/clubiona-terrestris-7716/>

Native status: Introduced

Distribution: FLO*; FAI*; PIC*; GRA; TER*; SMG; SMR*

Notes: Biogeographical Realm: Western Palearctic

Family Dictynidae***Altella lucida* (Simon, 1874)**

- <http://azoresbiportal.uac.pt/azores-species/altella-lucida-7692/>

Native status: Introduced

Distribution: SJG*; TER

Notes: Biogeographical Realm: Western Palearctic

***Emblyna acoreensis* Wunderlich, 1992**

- <http://azoresbiportal.uac.pt/azores-species/emblyna-acoreensis-7699/>

Native status: Azores endemic

Distribution: COR; FLO; FAI; PIC*; GRA; SJG; TER

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

***Lathys dentichelis* (Simon, 1883)**

- <http://azoresbiportal.uac.pt/azores-species/lathys-dentichelis-7083/>

Native status: Native

Distribution: COR; FLO*; FAI*; PIC; SJG*; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Western Palearctic (Macaronesia))

***Nigma puella* (Simon, 1870)**

- <http://azoresbiportal.uac.pt/azores-species/nigma-puella-7653/>

Native status: Introduced

Distribution: COR; FLO; FAI; PIC*; GRA; SJG*; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Western Palearctic (Macaronesia))

Family Dysderidae

***Dysdera crocata* C. L. Koch, 1838**

- <http://azoresbiportal.uac.pt/azores-species/dysdera-crocata-7212/>

Native status: Introduced

Distribution: COR; FLO; FAI; PIC; GRA; SJG*; TER; SMG; SMR

Notes: Also present: MAD (Biogeographical Realm: Cosmopolitan)

Family Linyphiidae

Acorigone acoreensis (Wunderlich, 1992)

- <http://azoresbiportal.uac.pt/azores-species/acorigone-acoreensis-7081/>

Native status: Azores endemic

Distribution: FLO*; FAI*; PIC*; SJG*; TER; SMG*; SMR*

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

Acorigone zebraneus Wunderlich, 2008

- <http://azoresbiportal.uac.pt/azores-species/acorigone-zebraneus-7753/>

Native status: Azores endemic

Distribution: SJG*

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

Agyneta decora (O. P.-Cambridge, 1871)

- <http://azoresbiportal.uac.pt/azores-species/agyneta-decora-7739/>

Native status: Introduced

Distribution: FLO*; SJG*; TER

Notes: Biogeographical Realm: Palearctic

Agyneta depigmentata Wunderlich, 2008

- <http://azoresbiportal.uac.pt/azores-species/agyneta-depigmentata-6947/>

Native status: Azores endemic

Distribution: FLO*

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

Agyneta rugosa Wunderlich, 1992

- <http://azoresbiportal.uac.pt/azores-species/agyneta-rugosa-7740/>

Native status: Azores endemic

Distribution: FAI*; SJG; SMG

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

***Canariphantes acoreensis* (Wunderlich, 1992)**

- <http://azoresbioportal.uac.pt/azores-species/canariphantes-acionensis-12410/>

Native status: Azores endemic

Distribution: FAI; PIC; SJG*; TER

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

***Canariphantes junipericola* Crespo & Bosmans, 2014**

- <http://azoresbioportal.uac.pt/azores-species/canariphantes-junipericola-12407/>

Native status: Azores endemic

Distribution: FLO*

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

***Canariphantes relictus* Crespo & Bosmans, 2014**

- <http://azoresbioportal.uac.pt/azores-species/canariphantes-relictus-12412/>

Native status: Azores endemic

Distribution: SMR*

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

***Erigone atra* Blackwall, 1833**

- <http://azoresbioportal.uac.pt/azores-species/erigone-atra-7096/>

Native status: Introduced

Distribution: COR; FLO; FAI; PIC; GRA; SJG*; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Holarctic)

***Erigone autumnalis* Emerton, 1882**

- <http://azoresbioportal.uac.pt/azores-species/erigone-autumnalis-7758/>

Native status: Introduced

Distribution: FLO*; FAI; PIC; GRA; SJG*; TER; SMG; SMR

Notes: Also present: CAN (Biogeographical Realm: Nearctic)

***Erigone dentipalpis* (Wider, 1834)**

- <http://azoresbiportal.uac.pt/azores-species/erigone-dentipalpis-7759/>

Native status: Introduced

Distribution: FLO*; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Holarctic)

***Lessertia dentichelis* (Simon, 1884)**

- <http://azoresbiportal.uac.pt/azores-species/lessertia-dentichelis-7773/>

Native status: Introduced

Distribution: SMG*

Notes: Also present: MAD; CAN (Biogeographical Realm: Western Palearctic)

***Meioneta fuscipalpa* (C. L. Koch, 1836)**

- <http://azoresbiportal.uac.pt/azores-species/meioneta-fuscipalpa-7742/>

Native status: Introduced

Distribution: COR; FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD (Biogeographical Realm: Palearctic)

***Mermessus bryantae* (Ivie & Barrows, 1935)**

- <http://azoresbiportal.uac.pt/azores-species/mermessus-bryantae-7755/>

Native status: Introduced

Distribution: FAI; PIC*; GRA; SJG*; TER; SMG

Notes: Biogeographical Realm: Nearctic

***Mermessus fradeorum* (Berland, 1932)**

- <http://azoresbiportal.uac.pt/azores-species/mermessus-fradeorum-7756/>

Native status: Introduced

Distribution: FLO; FAI; PIC; GRA; TER; SMG; SMR

Notes: Biogeographical Realm: Cosmopolitan

***Mermessus trilobatus* (Emerton, 1882)**

- <http://azoresbiportal.uac.pt/azores-species/mermessus-trilobatus-7757/>

Native status: Introduced

Distribution: SJG*; TER*; SMG*

Notes: Biogeographical Realm: Holarctic

***Microlinyphia johnsoni* (Blackwall, 1859)**

- <http://azoresbiportal.uac.pt/azores-species/microlinyphia-johnsoni-7150/>

Native status: Introduced

Distribution: FAI; PIC; SJG; TER; SMG

Notes: Also present: MAD; CAN (Biogeographical Realm: Western Palearctic (Macaronesia))

***Minicia floresensis* Wunderlich, 1992**

- <http://azoresbiportal.uac.pt/azores-species/minicia-floresensis-7215/>

Native status: Azores endemic

Distribution: FLO; PIC; SJG*; TER*; SMG*

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

***Nerience clathrata* (Sundevall, 1830)**

- <http://azoresbiportal.uac.pt/azores-species/nerience-clathrata-7772/>

Native status: Introduced

Distribution: FAI; SJG; TER*; SMG

Notes: Biogeographical Realm: Holarctic

***Oedothorax fuscus* (Blackwall, 1834)**

- <http://azoresbiportal.uac.pt/azores-species/oedothorax-fuscus-7763/>

Native status: Introduced

Distribution: COR; FLO*; FAI*; PIC; GRA; SJG*; TER; SMG*; SMR

Notes: Biogeographical Realm: Western Palearctic; Mediterranean

***Palliduphantes schmitzi* (Kulczynski, 1899)**

- <http://azoresbiportal.uac.pt/azores-species/palliduphantes-schmitzi-7743/>

Native status: Native

Distribution: COR; FLO; FAI; PIC; GRA; SJG*; TER; SMG; SMR*

Notes: Also present: MAD (Biogeographical Realm: Western Palearctic (Macaronesia))

***Pelecopsis parallela* (Wider, 1834)**

- <http://azoresbiportal.uac.pt/azores-species/pelecopsis-parallela-7769/>

Native status: Introduced

Distribution: FAI*; PIC; SJG; TER; SMG

Notes: Biogeographical Realm: Palearctic

***Porrhomma borgesii* Wunderlich, 2008**

- <http://azoresbiportal.uac.pt/azores-species/porrhomma-borgesii-7734/>

Native status: Azores endemic

Distribution: PIC*; TER*; SMG*

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

***Prinerigone vagans* (Audouin, 1826)**

- <http://azoresbiportal.uac.pt/azores-species/prinerigone-vagans-7761/>

Native status: Introduced

Distribution: FLO; PIC; GRA; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Palearctic)

***Savigniorrhapis acoreensis* Wunderlich, 1992**

- <http://azoresbiportal.uac.pt/azores-species/savigniorrhapis-acoreensis-7160/>

Native status: Azores endemic

Distribution: FLO*; FAI; PIC; SJG*; TER; SMG; SMR

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

***Savigniorhipis topographicus* Crespo, 2013**

- <http://azoresbiportal.uac.pt/azores-species/savigniorhipis-topographicus-7061/>

Native status: Azores endemic

Distribution: SJG*

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

***Tenuiphantes miguelensis* (Wunderlich, 1992)**

- <http://azoresbiportal.uac.pt/azores-species/tenuiphantes-miguelensis-7084/>

Native status: Native

Distribution: FLO*; FAI*; PIC*; GRA; SJG*; TER; SMG; SMR*

Notes: Also present: MAD (Biogeographical Realm: Western Palearctic (Macaronesia))

***Tenuiphantes tenuis* (Blackwall, 1852)**

- <http://azoresbiportal.uac.pt/azores-species/tenuiphantes-tenuis-7161/>

Native status: Introduced

Distribution: COR; FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Western Palearctic; Mediterranean)

***Walckenaeria grandis* (Wunderlich, 1992)**

- <http://azoresbiportal.uac.pt/azores-species/walckenaeria-grandis-7213/>

Native status: Azores endemic

Distribution: FLO*; PIC*; SJG*; TER; SMG

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

Family Lycosidae

***Pardosa acorensis* Simon, 1883**

- <http://azoresbiportal.uac.pt/azores-species/pardosa-acionensis-7712/>

Native status: Azores endemic

Distribution: COR; FLO; FAI; PIC; GRA; SJG*; TER; SMG; SMR

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

Family Mimetidae

Ero furcata (Villers, 1789)

- <http://azoresbiportal.uac.pt/azores-species/ero-furcata-7752/>

Native status: Introduced

Distribution: COR; FLO*; FAI*; PIC; GRA; SJG*; TER; SMG*; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Palearctic)

Family Oecobiidae

Oecobius navus Blackwall, 1859

- <http://azoresbiportal.uac.pt/azores-species/oecobius-navus-7963/>

Native status: Introduced

Distribution: FAI; PIC; SJG; TER; SMG; SMR

Notes: Also present: MAD; CAN; CVP (Biogeographical Realm: Cosmopolitan)

Family Onopidae

Orchestina furcillata Wunderlich, 2008

- <http://azoresbiportal.uac.pt/azores-species/orchestina-furcillata-7958/>

Native status: Azores endemic

Distribution: SMG*

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

Family Pisauridae

Pisaura acorensis Wunderlich, 1992

- <http://azoresbiportal.uac.pt/azores-species/pisaura-acorensis-7082/>

Native status: Azores endemic

Distribution: FLO; FAI; PIC*; GRA; SJG*; TER; SMG; SMR

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

Family Salticidae

Macaroeris cata (Blackwall, 1867)

- <http://azoresbioportal.uac.pt/azores-species/macaroeris-cata-7152/>

Native status: Native

Distribution: COR; FLO; FAI; PIC*; GRA; SJG*; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Western Palearctic (Macaronesia); Romania)

Macaroeris diligens (Blackwall, 1867)

- <http://azoresbioportal.uac.pt/azores-species/macaroeris-diligens-7736/>

Native status: Native

Distribution: COR; FAI; TER; SMG; SMR*

Notes: Also present: MAD; CAN (Biogeographical Realm: Western Palearctic (Macaronesia))

Neon acoreensis Wunderlich, 2008

- <http://azoresbioportal.uac.pt/azores-species/neon-acoreensis-7790/>

Native status: Azores endemic

Distribution: FLO; FAI; PIC*; SJG*; TER; SMG; SMR

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

Pseudeuophrys vafra (Blackwall, 1867)

- <http://azoresbioportal.uac.pt/azores-species/pseudeuophrys-vafra-7701/>

Native status: Introduced

Distribution: COR; FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD (Biogeographical Realm: Palearctic)

Family Tetragnathidae

Metellina merianae (Scopoli, 1763)

- <http://azoresbiportal.uac.pt/azores-species/metellina-merianae-7965/>

Native status: Introduced

Distribution: FLO*; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD (Biogeographical Realm: Palearctic)

Sancus acoreensis (Wunderlich, 1992)

- <http://azoresbiportal.uac.pt/azores-species/sancus-acoreensis-7971/>

Native status: Azores endemic

Distribution: FLO; FAI; PIC; SJG*; TER; SMG; SMR

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

Family Theridiidae

Cryptachaea blattea (Urquhart, 1886)

- <http://azoresbiportal.uac.pt/azores-species/cryptachaea-blattea-7774/>

Native status: Introduced

Distribution: COR; FLO; FAI; PIC; GRA; TER; SMG; SMR

Notes: Also present: CAN (Biogeographical Realm: Nearctic)

Lasaeola oceanica Simon, 1883

- <http://azoresbiportal.uac.pt/azores-species/lasaeola-oceanica-7751/>

Native status: Azores endemic

Distribution: COR; FLO; FAI*; PIC*; GRA; SJG*; TER; SMG; SMR

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

Neottiura bimaculata (Linnaeus, 1767)

- <http://azoresbiportal.uac.pt/azores-species/neottiura-bimaculata-7778/>

Native status: Introduced

Distribution: PIC; GRA; SJG; TER; SMG; SMR

Notes: Biogeographical Realm: Holarctic

***Rhomphaea nasica* (Simon, 1873)**

- <http://azoresbiportal.uac.pt/azores-species/rhomphaea-nasica-7766/>

Native status: Introduced

Distribution: FLO; PIC; GRA; TER; SMG

Notes: Also present: MAD (Biogeographical Realm: Palearctic)

***Rugathodes acorensis* Wunderlich, 1992**

- <http://azoresbiportal.uac.pt/azores-species/rugathodes-acorensis-7698/>

Native status: Azores endemic

Distribution: FLO; FAI; PIC; GRA; SJG*; TER; SMG; SMR

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

***Steatoda grossa* (C. L. Koch, 1838)**

- <http://azoresbiportal.uac.pt/azores-species/steatoda-grossa-7691/>

Native status: Introduced

Distribution: COR; FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Cosmopolitan)

***Theridion melanurum* Hahn, 1831**

- <http://azoresbiportal.uac.pt/azores-species/theridion-melanurum-9697/>

Native status: Introduced

Distribution: PIC*; SMG*; SMR*

Notes: Also present: MAD (Biogeographical Realm: Holarctic)

***Theridion musivivum* Schmidt, 1956**

- <http://azoresbiportal.uac.pt/azores-species/theridion-musivivum-7703/>

Native status: Native

Distribution: COR; FLO; FAI; PIC*; GRA; TER; SMG; SMR

Notes: Also present: MAD; CAN; CVP (Biogeographical Realm: Western Palearctic (Macaronesia))

Family Thomisidae

Xysticus cor Canestrini, 1873

- <http://azoresbiportal.uac.pt/azores-species/xysticus-cor-7922/>

Native status: Native

Distribution: COR; FLO; FAI*; PIC; GRA; SJG*; TER; SMG; SMR*

Notes: Biogeographical Realm: Palearctic

Xysticus nubilus Simon, 1875

- <http://azoresbiportal.uac.pt/azores-species/xysticus-nubilus-7737/>

Native status: Introduced

Distribution: FLO*; FAI; PIC; GRA; SJG*; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Palearctic)

Family Zodariidae

Zodarion atlanticum Pekár & Cardoso, 2006

- <http://azoresbiportal.uac.pt/azores-species/zodarion-atlanticum-7786/>

Native status: Introduced

Distribution: FAI; PIC; GRA; TER*; SMG

Notes: Biogeographical Realm: Palearctic

Class Diplopoda

Order Polydesmida

Family Paradoxosomatidae

Oxidus gracilis (C. L. Koch, 1847)

- <http://azoresbioportal.uac.pt/azores-species/oxidus-gracilis-8134/>

Native status: Introduced

Distribution: COR; FLO*; FAI*; PIC; GRA; TER*; SMG; SMR*

Notes: Also present: MAD; CAN (Biogeographical Realm: Afro-tropical; Australian; Eastern Palearctic; Nearctic; Neotropical; Oriental)

Family Polydesmidae

Brachydesmus superus Latzel, 1884

- <http://azoresbioportal.uac.pt/azores-species/brachydesmus-superus-8136/>

Native status: Introduced

Distribution: FLO*; FAI; PIC; SJG; TER*; SMG; SMR

Notes: Also present: MAD; CAN; CVP (Biogeographical Realm: Australian; Eastern Palearctic; Nearctic; North Africa)

Polydesmus coriaceus Porat, 1871

- <http://azoresbioportal.uac.pt/azores-species/polydesmus-coriaceus-8146/>

Native status: Introduced

Distribution: COR; FLO*; FAI; PIC; GRA; SJG*; TER; SMG; SMR

Notes: Also present: CAN (Biogeographical Realm: Western Palearctic)

Order Julida

Family Blaniulidae

Blaniulus guttulatus (Fabricius, 1798)

- <http://azoresbioportal.uac.pt/azores-species/blaniulus-guttulatus-8151/>

Native status: Introduced

Distribution: COR; FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR*

Notes: Also present: MAD (Biogeographical Realm: Australian; Eastern Palearctic; Nearctic)

***Choneiulus palmatus* (Nemec, 1895)**

- <http://azoresbiportal.uac.pt/azores-species/choneiulus-palmatus-8152/>

Native status: Introduced

Distribution: FLO*; PIC*; GRA; SJG*; TER; SMG; SMR*

Notes: Also present: MAD; CAN (Biogeographical Realm: Nearctic)

***Nopoiulus kochii* (Gervais, 1847)**

- <http://azoresbiportal.uac.pt/azores-species/nopoiulus-kochii-8153/>

Native status: Introduced

Distribution: FLO*; GRA; SMG; SMR*

Notes: Also present: MAD; CAN (Biogeographical Realm: Australian; Near East; Nearctic; Neotropical)

***Proteroiulus fuscus* (Am Stein, 1857)**

- <http://azoresbiportal.uac.pt/azores-species/proteroiulus-fuscus-8154/>

Native status: Introduced

Distribution: FLO*; FAI; TER*; SMG; SMR*

Notes: Also present: MAD; CAN (Biogeographical Realm: Nearctic)

Family Julidae

***Brachyiulus pusillus* (Leach, 1814)**

- <http://azoresbiportal.uac.pt/azores-species/brachyiulus-pusillus-8156/>

Native status: Introduced

Distribution: FLO; FAI; GRA; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Afro-tropical; Australian; Nearctic)

***Cylindroiulus latestriatus* (Curtis, 1845)**

- <http://azoresbiportal.uac.pt/azores-species/cylindroiulus-latestriatus-8159/>

Native status: Introduced

Distribution: COR; FLO*; FAI; SMG; SMR

Notes: Biogeographical Realm: Afro-tropical; Australian; Nearctic; Oriental

***Cylindroiulus propinquus* (Porat, 1870)**

- <http://azoresbiportal.uac.pt/azores-species/cylindroiulus-propinquus-8161/>

Native status: Introduced

Distribution: COR; FLO; FAI; PIC; GRA; SJG*; TER; SMG; SMR

Notes: Biogeographical Realm: Palearctic

***Ommatoiulus moreletii* (Lucas, 1860)**

- <http://azoresbiportal.uac.pt/azores-species/ommatoiulus-moreletii-6874/>

Native status: Introduced

Distribution: COR; FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Afro-tropical; Australian)

Order Chordeumatida**Family Haplobainosomatidae*****Haplobainosoma lusitanum* Verhoeff, 1900**

- <http://azoresbiportal.uac.pt/azores-species/haplobainosoma-lusitanum-8162/>

Native status: Introduced

Distribution: FAI*; PIC; TER*; SMG*; SMR*

Notes: Biogeographical Realm: Palearctic

Class Chilopoda

Order Lithobiomorpha

Family Lithobiidae

Lithobius pilicornis subsp. pilicornis Newport, 1844

- <http://azoresbiportal.uac.pt/azores-species/lithobius-pilicornis-pilicornis-13445/>

Native status: Native

Distribution: COR; FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Afro-tropical)

Order Scolopendromorpha

Family Cryptopidae

Cryptops hortensis (Donovan, 1810)

- <http://azoresbiportal.uac.pt/azores-species/cryptops-hortensis-8171/>

Native status: Native

Distribution: COR; FLO; FAI*; PIC; GRA; SJG; TER*; SMG

Notes: Also present: MAD; CAN (Biogeographical Realm: Western Palearctic)

Order Geophilomorpha

Family Geophilidae

Geophilus truncorum Bergsoe & Meinert, 1866

- <http://azoresbiportal.uac.pt/azores-species/geophilus-truncorum-8174/>

Native status: Native

Distribution: FLO; FAI; PIC*; GRA; SJG*; TER*; SMG*; SMR

Notes: Also present: MAD (Biogeographical Realm: Western Palearctic)

Family Linotaeniidae

Strigamia crassipes (C. L. Koch, 1835)

- <http://azoresbiportal.uac.pt/azores-species/strigamia-crassipes-8177/>

Native status: Native

Distribution: FLO*; TER*; SMG*

Notes: Biogeographical Realm: Western Palearctic

Class Insecta

Order Microcoryphia

Family Machilidae

Dilta saxicola (Womersley, 1930)

- <http://azoresbiportal.uac.pt/azores-species/dilta-saxicola-8352/>

Native status: Native

Distribution: COR; FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Biogeographical Realm: Easternern Palearctic

Trigoniophthalmus borgesii Mendes, Gaju, Bach & Molero, 2000

- <http://azoresbiportal.uac.pt/azores-species/trigoniophthalmus-borgesii-8350/>

Native status: Azores endemic

Distribution: FAI*; PIC*; SJG*; TER; SMG*; SMR

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

Order Ephemeroptera

Family Baetidae

Cloeon dipterum Linnaeus, 1761

- <http://azoresbiportal.uac.pt/azores-species/cloeon-dipterum-8286/>

Native status: Native

Distribution: FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Holarctic)

Order Blattaria

Family Polyphagidae

Zetha vestita (Brullé, 1838)

- <http://azoresbiportal.uac.pt/azores-species/zetha-vestita-7095/>

Native status: Native

Distribution: FLO*; FAI; PIC*; SJG; TER; SMG; SMR*

Notes: Also present: MAD; CAN; CVP (Biogeographical Realm: Palearctic)

Order Orthoptera

Family Conocephalidae

Conocephalus chavesi (Bolivar, 1905)

- <http://azoresbiportal.uac.pt/azores-species/conocephalus-chavesi-8303/>

Native status: Azores endemic

Distribution: PIC; TER; SMG

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

Family Gryllidae

Gryllus bimaculatus De Geer, 1773

- <http://azoresbiportal.uac.pt/azores-species/gryllus-bimaculatus-8305/>

Native status: Introduced

Distribution: COR; FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD; CAN; CVP (Biogeographical Realm: Afro-tropical; Eastern Palearctic; Near East; North Africa; Oriental)

Order Dermaptera

Family Anisolabididae

Euborellia annulipes (Lucas, 1847)

- <http://azoresbiportal.uac.pt/azores-species/euborellia-annulipes-8315/>

Native status: Introduced

Distribution: COR; FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD; CAN; CVP (Biogeographical Realm: Cosmopolitan)

Family Forficulidae

Forficula auricularia Linnaeus, 1758

- <http://azoresbiportal.uac.pt/azores-species/forficula-auricularia-8316/>

Native status: Introduced

Distribution: COR; FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Holarctic)

Order Psocoptera

Family Caeciliusidae

Valenzuela burmeisteri (Brauer, 1876)

- <http://azoresbiportal.uac.pt/azores-species/valenzuela-burmeisteri-7098/>

Native status: Native

Distribution: FLO*; FAI*; SJG*; TER*; SMG*; SMR*

Notes: Also present: MAD; CAN (Biogeographical Realm: Holarctic)

Valenzuela flavidus (Stephens, 1836)

- <http://azoresbiportal.uac.pt/azores-species/valenzuela-flavidus-8351/>

Native status: Native

Distribution: COR; FLO; FAI*; PIC*; GRA; SJG*; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Holarctic)

Family Ectopsocidae

Ectopsocus briggsi McLachlan, 1899

- <http://azoresbiportal.uac.pt/azores-species/ectopsocus-briggsi-8349/>

Native status: Introduced

Distribution: COR; FLO; FAI*; PIC; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Cosmopolitan)

Ectopsocus pumilis (Banks, 1920)

- <http://azoresbiportal.uac.pt/azores-species/ectopsocus-pumilis-8331/>

Native status: Introduced

Distribution: SMG; SMR*

Notes: Biogeographical Realm: Cosmopolitan

Ectopsocus strauchi Enderlein, 1906

- <http://azoresbiportal.uac.pt/azores-species/ectopsocus-strauchi-8333/>

Native status: Native

Distribution: COR; FLO; FAI*; PIC*; GRA; TER; SMG; SMR

Notes: Also present: MAD; CAN; CVP (Biogeographical Realm: Palearctic)

Family Elipsocidae

Elipsocus azoricus Meinander, 1975

- <http://azoresbiportal.uac.pt/azores-species/elipsocus-azoricus-7156/>

Native status: Azores endemic

Distribution: COR; FLO*; FAI*; PIC*; GRA; SJG*; TER*; SMG; SMR

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

Elipsocus brincki Badonnel, 1963

- <http://azoresbiportal.uac.pt/azores-species/elipsocus-brincki-8348/>

Native status: Azores endemic

Distribution: COR; FLO*; FAI*; PIC*; GRA; SJG; TER*; SMG; SMR*

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

Family Epipsocidae

Bertkauia lucifuga (Rambur, 1842)

- <http://azoresbiportal.uac.pt/azores-species/bertkauia-lucifuga-8346/>

Native status: Native

Distribution: FAI*; TER; SMG

Notes: Also present: MAD (Biogeographical Realm: Western Palearctic)

Family Lachesillidae

Lachesilla greeni (Pearman, 1933)

- <http://azoresbiportal.uac.pt/azores-species/lachesilla-greeni-8334/>

Native status: Introduced

Distribution: TER*; SMG; SMR*

Notes: Also present: MAD (Biogeographical Realm: Western Palearctic)

Family Peripsocidae

Peripsocus milleri (Tillyard, 1923)

- <http://azoresbiportal.uac.pt/azores-species/peripsocus-milleri-8341/>

Native status: Native

Distribution: FAI*; SJG*; TER*; SMG

Notes: Also present: MAD; CAN (Biogeographical Realm: Cosmopolitan)

Peripsocus phaeopterus (Stephens, 1836)

- <http://azoresbiportal.uac.pt/azores-species/peripsocus-phaeopterus-8342/>

Native status: Native

Distribution: PIC*; SJG*; TER*; SMG; SMR

Notes: Also present: CAN (Biogeographical Realm: Palearctic)

***Peripsocus subfasciatus* (Rambur, 1842)**

- <http://azoresbiportal.uac.pt/azores-species/peripsocus-subfasciatus-8343/>

Native status: Native

Distribution: FAI*; TER*; SMG; SMR

Notes: Biogeographical Realm: Holarctic

Family Psocidae

***Atlantopsocus adustus* (Hagen, 1865)**

- <http://azoresbiportal.uac.pt/azores-species/atlantopsocus-adustus-6897/>

Native status: Native

Distribution: FLO*; FAI*; PIC*; GRA; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Western Palearctic (Macaronesia))

Family Trichopsocidae

***Trichopsocus clarus* (Banks, 1908)**

- <http://azoresbiportal.uac.pt/azores-species/trichopsocus-clarus-7158/>

Native status: Native

Distribution: COR; FLO; FAI*; PIC*; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Cosmopolitan)

Family Trogidae

***Lepinotus reticulatus* Enderlein, 1905**

- <http://azoresbiportal.uac.pt/azores-species/lepinotus-reticulatus-8362/>

Native status: Introduced

Distribution: TER*

Notes: Also present: MAD; CAN (Biogeographical Realm: Cosmopolitan)

Order Hemiptera

Family Anthocoridae

Brachysteles parvicornis (A. Costa, 1847)

- <http://azoresbiportal.uac.pt/azores-species/brachysteles-parvicornis-7079/>

Native status: Native

Distribution: PIC*; GRA; TER*; SMG*; SMR

Notes: Also present: CAN (Biogeographical Realm: Holartic; Afro-tropical; Northern Asia (except China))

Buchananiella continua (White, 1880)

- <http://azoresbiportal.uac.pt/azores-species/buchananiella-continua-7214/>

Native status: Introduced

Distribution: FLO; FAI; PIC; SJG*; TER; SMG; SMR*

Notes: Also present: MAD; CAN (Biogeographical Realm: Afro-tropical; Australian; Neotropical)

Orius laevigatus subsp. laevigatus (Fieber, 1860)

- <http://azoresbiportal.uac.pt/azores-species/orius-laevigatus-laevigatus-13520/>

Native status: Native

Distribution: FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Also present: CAN (Biogeographical Realm: Oriental)

Family Aphididae

Acyrtosiphon pisum (Harris, 1776)

- <http://azoresbiportal.uac.pt/azores-species/acyrtosiphon-pisum-8553/>

Native status: Native

Distribution: FLO*; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD (Biogeographical Realm: Cosmopolitan)

***Amphorophora rubi* (Kaltenbach, 1843)**

- <http://azoresbioportal.uac.pt/azores-species/amphorophora-rubi-8560/>

Native status: Native

Distribution: FLO*; GRA; TER

Notes: Also present: MAD; CAN (Biogeographical Realm: Australian; Eastern Palearctic; Near East; Nearctic; North Africa)

***Aphis craccivora* Koch, 1854**

- <http://azoresbioportal.uac.pt/azores-species/aphis-craccivora-8555/>

Native status: Native

Distribution: COR; FLO; FAI; PIC; TER; SMG; SMR

Notes: Also present: MAD; CAN; CVP (Biogeographical Realm: Cosmopolitan)

***Aulacorthum solani* (Kaltenbach, 1843)**

- <http://azoresbioportal.uac.pt/azores-species/aulacorthum-solani-8576/>

Native status: Native

Distribution: FLO; FAI*; TER; SMG; SMR

Notes: Also present: MAD; CAN; CVP (Biogeographical Realm: Cosmopolitan)

***Cavariella aegopodii* (Scopoli, 1763)**

- <http://azoresbioportal.uac.pt/azores-species/cavariella-aegopodii-8590/>

Native status: Introduced

Distribution: FLO; SJG*; TER; SMG; SMR

Notes: Biogeographical Realm: Cosmopolitan

***Dysaphis plantaginea* (Passerini, 1860)**

- <http://azoresbioportal.uac.pt/azores-species/dysaphis-plantaginea-8602/>

Native status: Introduced

Distribution: FLO; FAI; GRA; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Cosmopolitan)

***Longiunguis luzulella* Hille Ris Lambers, 1947**

- <http://azoresbiportal.uac.pt/azores-species/longiunguis-luzulella-8613/>

Native status: Introduced

Distribution: SJG*

Notes: Biogeographical Realm: Western Palearctic

***Myzus cerasi* (Fabricius, 1775)**

- <http://azoresbiportal.uac.pt/azores-species/myzus-cerasi-8641/>

Native status: Introduced

Distribution: FLO*; TER

Notes: Also present: MAD; CAN (Biogeographical Realm: Australian; Eastern Palearctic; Near East; Nearctic; North Africa; Oriental)

***Neomyzus circumflexus* (Buckton, 1876)**

- <http://azoresbiportal.uac.pt/azores-species/neomyzus-circumflexus-8644/>

Native status: Introduced

Distribution: FLO*; TER; SMG

Notes: Also present: MAD (Biogeographical Realm: Cosmopolitan)

***Pseudacaudella rubida* (Börner, 1939)**

- <http://azoresbiportal.uac.pt/azores-species/pseudacaudella-rubida-8653/>

Native status: Native

Distribution: FLO*; PIC; TER; SMG*; SMR

Notes: Biogeographical Realm: Nearctic

***Rhopalosiphoninus latysiphon* (Davidson, 1912)**

- <http://azoresbiportal.uac.pt/azores-species/rhopalosiphoninus-latysiphon-7155/>

Native status: Introduced

Distribution: FLO*; FAI*; PIC*; GRA; SJG*; TER*; SMG; SMR*

Notes: Also present: MAD; CAN (Biogeographical Realm: Cosmopolitan)

***Rhopalosiphum oxyacanthae* (Schrank, 1801)**

- <http://azoresbiportal.uac.pt/azores-species/rhopalosiphum-oxyacanthae-8659/>

Native status: Introduced

Distribution: FLO; FAI; PIC; GRA; SJG*; TER; SMG; SMR

Notes: Also present: MAD (Biogeographical Realm: Western Palaearctic; Japan)

***Rhopalosiphum padi* (Linnaeus, 1758)**

- <http://azoresbiportal.uac.pt/azores-species/rhopalosiphum-padi-8662/>

Native status: Introduced

Distribution: COR; FLO; PIC; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Cosmopolitan)

***Rhopalosiphum rufiabdominalis* (Sasaki, 1899)**

- <http://azoresbiportal.uac.pt/azores-species/rhopalosiphum-rufiabdominale-8663/>

Native status: Introduced

Distribution: COR; FLO; FAI; PIC*; GRA; SJG; TER*; SMG; SMR

Notes: Also present: MAD (Biogeographical Realm: Cosmopolitan)

***Toxoptera aurantii* (Boyer de Fonscolombe, 1841)**

- <http://azoresbiportal.uac.pt/azores-species/toxoptera-aurantii-8672/>

Native status: Introduced

Distribution: FLO; FAI; PIC*; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD; CAN; CVP (Biogeographical Realm: Cosmopolitan)

***Uroleucon erigeronense* (Thomas, 1878)**

- <http://azoresbiportal.uac.pt/azores-species/uroleucon-erigeronense-8673/>

Native status: Introduced

Distribution: SJG*; TER*; SMG*; SMR*

Notes: Biogeographical Realm: Eastern Palearctic; Near East; Nearctic; Neotropical; North Africa; Oriental

Family Cercopidae

Philaenus spumarius (Linnaeus, 1758)

- <http://azoresbiportal.uac.pt/azores-species/philaenus-spumarius-8400/>

Native status: Introduced

Distribution: TER; SMG

Notes: Also present: CAN (Biogeographical Realm: Cosmopolitan)

Family Cicadellidae

Anoscopus albifrons (Linnaeus, 1758)

- <http://azoresbiportal.uac.pt/azores-species/anoscopus-albifrons-8403/>

Native status: Native

Distribution: FLO*; FAI*; PIC; GRA; SJG*; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Holarctic)

Aphrodes hamiltoni Quartau & Borges, 2003

- <http://azoresbiportal.uac.pt/azores-species/aphrodes-hamiltoni-8404/>

Native status: Azores endemic

Distribution: FLO*; FAI*; PIC*; GRA; SJG*; TER*; SMG*; SMR*

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

Eupteryx azorica Ribaut, 1941

- <http://azoresbiportal.uac.pt/azores-species/eupteryx-azorica-6899/>

Native status: Azores endemic

Distribution: COR; FLO; PIC; GRA; SJG; TER; SMG

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

Opsius stactogallus Fieber, 1866

- <http://azoresbiportal.uac.pt/azores-species/opsius-stactogalus-8414/>

Native status: Native

Distribution: COR; FLO*; FAI; PIC; GRA; SJG; TER; SMR

Notes: Also present: CAN (Biogeographical Realm: Holarctic)

Family Cixiidae

Cixius azofloresi Remane & Asche, 1979

- <http://azoresbiportal.uac.pt/azores-species/cixius-azofloresi-8420/>

Native status: Azores endemic

Distribution: COR; FLO

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

Cixius azomariae Remane & Asche, 1979

- <http://azoresbiportal.uac.pt/azores-species/cixius-azomariae-8417/>

Native status: Azores endemic

Distribution: SMR

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

Cixius azopifajo subsp. azofa Remane & Asche, 1979

- <http://azoresbiportal.uac.pt/azores-species/cixius-azopifajo-azofa-13516/>

Native status: Azores endemic

Distribution: FAI

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

Cixius azopifajo subsp. azojo Remane & Asche, 1979

- <http://azoresbiportal.uac.pt/azores-species/cixius-azopifajo-azojo-13518/>

Native status: Azores endemic

Distribution: SJG

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

Cixius azopifajo subsp. azopifajo Remane & Asche, 1979

- <http://azoresbiportal.uac.pt/azores-species/cixius-azopifajo-azopifajo-13517/>

Native status: Azores endemic

Distribution: PIC

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

***Cixius azoricus subsp. azoricus* Lindberg, 1954**

- <http://azoresbiportal.uac.pt/azores-species/cixius-azoricus-azoricus-13532/>

Native status: Azores endemic

Distribution: FAI; SJG; TER; SMG*

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

***Cixius azoricus subsp. azoropicoi* Remane & Asche, 1979**

- <http://azoresbiportal.uac.pt/azores-species/cixius-azoricus-azoropicoi-13519/>

Native status: Azores endemic

Distribution: PIC

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

***Cixius azoterceirae* Remane & Asche, 1979**

- <http://azoresbiportal.uac.pt/azores-species/cixius-azoterceirae-7099/>

Native status: Azores endemic

Distribution: TER

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

***Cixius insularis* Lindberg, 1954**

- <http://azoresbiportal.uac.pt/azores-species/cixius-insularis-8419/>

Native status: Azores endemic

Distribution: SMG

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

Family Cydnidae

Geotomus punctulatus (A. Costa, 1847)

- <http://azoresbiportal.uac.pt/azores-species/geotomus-punctulatus-8440/>

Native status: Native

Distribution: FAI*; GRA; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Western Palearctic)

Family Delphacidae

Megamelodes quadrimaculatus (Signoret, 1865)

- <http://azoresbiportal.uac.pt/azores-species/megamelodes-quadrimaculatus-8427/>

Native status: Native

Distribution: FLO*; FAI*; PIC; GRA; SJG*; TER; SMG*; SMR

Notes: Also present: MAD (Biogeographical Realm: Western Palearctic (Macaronesia))

Family Drepanosiphidae

Anoecia corni (Fabricius, 1775)

- <http://azoresbiportal.uac.pt/azores-species/anoecia-corni-8629/>

Native status: Introduced

Distribution: FLO; PIC; SJG*; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Cosmopolitan (except Australia))

Family Flatidae

Cyphopterus adscendens (Herrich-Schaeffer, 1835)

- <http://azoresbiportal.uac.pt/azores-species/cyphopterus-adscendens-7089/>

Native status: Native

Distribution: COR; FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR*

Notes: Biogeographical Realm: Western Palearctic

Family Lachnidae

Cinara juniperi (De Geer, 1773)

- <http://azoresbiportal.uac.pt/azores-species/cinara-juniperi-7078/>

Native status: Native

Distribution: COR; FLO*; FAI*; PIC; SJG*; TER; SMG; SMR

Notes: Also present: MAD (Biogeographical Realm: Holarctic)

Family Lygaeidae

Beosus maritimus (Scopoli, 1763)

- <http://azoresbiportal.uac.pt/azores-species/beosus-maritimus-8446/>

Native status: Native

Distribution: FLO; FAI; TER; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Western Palearctic)

Gastrodes grossipes subsp. grossipes (De Geer, 1773)

- <http://azoresbiportal.uac.pt/azores-species/gastrodes-grossipes-grossipes-13559/>

Native status: Introduced

Distribution: TER*

Notes: Biogeographical Realm: Palearctic

Heterogaster urticae (Fabricius, 1775)

- <http://azoresbiportal.uac.pt/azores-species/heterogaster-urticae-8449/>

Native status: Native

Distribution: PIC; TER*; SMG

Notes: Also present: MAD (Biogeographical Realm: Western Palearctic)

Kleidocerys ericae (Horváth, 1908)

- <http://azoresbiportal.uac.pt/azores-species/kleidocerys-ericae-7157/>

Native status: Native

Distribution: COR; FLO; FAI; PIC; GRA; SJG*; TER; SMG; SMR*

Notes: Also present: MAD; CAN (Biogeographical Realm: Western Palearctic)

***Microplax plagiata* (Fieber, 1837)**

- <http://azoresbiportal.uac.pt/azores-species/microplax-plagiata-8451/>

Native status: Native

Distribution: SMR*

Notes: Also present: CAN (Biogeographical Realm: Palearctic)

***Nysius atlantidum* Horváth, 1990**

- <http://azoresbiportal.uac.pt/azores-species/nysius-atlantidum-7085/>

Native status: Azores endemic

Distribution: FLO; FAI; GRA; TER; SMG; SMR*

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

***Nysius ericae subsp. ericae* Schilling, 1829**

- <http://azoresbiportal.uac.pt/azores-species/nysius-ericae-ericae-13521/>

Native status: Native

Distribution: COR; FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Afro-tropical)

***Plinthisus brevipennis* (Latreille, 1807)**

- <http://azoresbiportal.uac.pt/azores-species/plinthisus-brevipennis-8452/>

Native status: Native

Distribution: FAI*; PIC; GRA; SMG; SMR

Notes: Also present: MAD (Biogeographical Realm: Western Palearctic)

***Plinthisus minutissimus* Fieber, 1864**

- <http://azoresbiportal.uac.pt/azores-species/plinthisus-minutissimus-7151/>

Native status: Native

Distribution: FAI*; TER

Notes: Biogeographical Realm: Western Palearctic

***Scolopostethus decoratus* (Hahn, 1833)**

- <http://azoresbiportal.uac.pt/azores-species/scolopostethus-decoratus-7097/>

Native status: Native

Distribution: FLO; FAI*; PIC; GRA; TER; SMG; SMR

Notes: Biogeographical Realm: Palearctic

Family Microphysidae

***Loricula coleoptrata* (Fallén, 1807)**

- <http://azoresbiportal.uac.pt/azores-species/loricula-coleoptrata-8458/>

Native status: Native

Distribution: FAI; SMG*; SMR

Notes: Biogeographical Realm: Western Palearctic

***Loricula elegantula* (Bärensprung, 1858)**

- <http://azoresbiportal.uac.pt/azores-species/loricula-elegantula-8445/>

Native status: Native

Distribution: FLO; PIC*; GRA; SMG*; SMR

Notes: Biogeographical Realm: Western Palearctic

Family Miridae

***Campyloneura virgula* (Herrich-Schaeffer, 1835)**

- <http://azoresbiportal.uac.pt/azores-species/campyloneura-virgula-8460/>

Native status: Native

Distribution: FLO; FAI; PIC; GRA; SJG*; TER; SMG

Notes: Biogeographical Realm: Nearctic

***Closterotomus norwegicus* (Gmelin, 1790)**

- <http://azoresbioportal.uac.pt/azores-species/closterotomus-norwegicus-8461/>

Native status: Native

Distribution: FLO; FAI; PIC; TER; SMR*

Notes: Also present: MAD; CAN (Biogeographical Realm: Australian; Nearctic)

***Heterotoma planicornis* (Pallas, 1772)**

- <http://azoresbioportal.uac.pt/azores-species/heterotoma-planicornis-8462/>

Native status: Native

Distribution: FAI; PIC; GRA; TER; SMG; SMR

Notes: Biogeographical Realm: Nearctic

***Monalocoris filicis* (Linnaeus, 1758)**

- <http://azoresbioportal.uac.pt/azores-species/monalocoris-filicis-8465/>

Native status: Native

Distribution: COR; FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Biogeographical Realm: Holartic; Afro-tropical; Northern Asia (except China)

***Pinalitus oromii* J. Ribes, 1992**

- <http://azoresbioportal.uac.pt/azores-species/pinalitus-oromii-7093/>

Native status: Azores endemic

Distribution: FLO*; FAI; PIC; GRA; SJG; TER*; SMG; SMR*

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

***Polymerus cognatus* (Fieber, 1858)**

- <http://azoresbioportal.uac.pt/azores-species/polymerus-cognatus-8474/>

Native status: Native

Distribution: COR; FLO*; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Biogeographical Realm: Nearctic

***Polymerus vulneratus* (Panzer, 1806)**

- <http://azoresbioportal.uac.pt/azores-species/polymerus-vulneratus-8475/>

Native status: Native

Distribution: PIC*; TER

Notes: Biogeographical Realm: Nearctic

Family Nabidae***Nabis pseudoferus subsp. ibericus* Remane, 1962**

- <http://azoresbioportal.uac.pt/azores-species/nabis-pseudoferus-ibericus-13443/>

Native status: Native

Distribution: COR; FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Western Palearctic)

Family Pentatomidae***Nezara viridula* (Linnaeus, 1758)**

- <http://azoresbioportal.uac.pt/azores-species/nezara-viridula-8482/>

Native status: Introduced

Distribution: COR; FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD; CAN; CVP (Biogeographical Realm: Cosmopolitan)

Family Psyllidae***Acizzia uncatoides* (Ferris & Klyver, 1932)**

- <http://azoresbioportal.uac.pt/azores-species/acizzia-uncatoides-8547/>

Native status: Introduced

Distribution: PIC; GRA; TER*

Notes: Also present: CAN (Biogeographical Realm: Australian)

***Cacopsylla pulchella* (Löw, 1877)**

- <http://azoresbiportal.uac.pt/azores-species/cacopsylla-pulchella-8527/>

Native status: Introduced

Distribution: PIC*

Notes: Biogeographical Realm: Western Palearctic

***Strophingia harteni* Hodkinson, 1981**

- <http://azoresbiportal.uac.pt/azores-species/strophingia-harteni-7087/>

Native status: Azores endemic

Distribution: COR; FLO; FAI*; PIC*; GRA; SJG*; TER*; SMG; SMR*

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

Family Reduviidae***Empicoris rubromaculatus* (Blackburn, 1889)**

- <http://azoresbiportal.uac.pt/azores-species/empicoris-rubromaculatus-8483/>

Native status: Introduced

Distribution: PIC; TER*; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Afro-tropical; Australian; Neotropical; Oriental)

Family Saldidae***Saldula palustris* (Douglas, 1874)**

- <http://azoresbiportal.uac.pt/azores-species/saldula-palustris-8471/>

Native status: Native

Distribution: TER; SMG

Notes: Also present: MAD; CAN (Biogeographical Realm: Afro-tropical; Eastern Palearctic; Near East; North Africa)

Family Tingidae

Acalypta parvula (Fallén, 1807)

- <http://azoresbiportal.uac.pt/azores-species/acalypta-parvula-8491/>

Native status: Native

Distribution: FLO; FAI; PIC; TER; SMG

Notes: Also present: MAD; CAN (Biogeographical Realm: Nearctic; North Africa (except Sinai Peninsula))

Family Triozidae

Trioza laurisilvae Hodkinson, 1990

- <http://azoresbiportal.uac.pt/azores-species/trioza-laurisilvae-7090/>

Native status: Native

Distribution: FLO*; FAI*; PIC; GRA; SJG*; TER*; SMG; SMR*

Notes: Also present: MAD; CAN (Biogeographical Realm: Western Palearctic (Macaronesia))

Order Thysanoptera

Family Aeolothripidae

Aeolothrips collaris Priesner, 1919

- <http://azoresbiportal.uac.pt/azores-species/aeolothrips-collaris-8269/>

Native status: Native

Distribution: FAI; PIC; SJG; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Palearctic)

Aeolothrips gloriosus Bagnall, 1914

- <http://azoresbiportal.uac.pt/azores-species/aeolothrips-gloriosus-8271/>

Native status: Native

Distribution: FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Biogeographical Realm: Palearctic

Family Phlaeothripidae

***Eurythrips tristis* Hood, 1941**

- <http://azoresbiportal.uac.pt/azores-species/eurythrips-tristis-8370/>

Native status: Introduced

Distribution: SJG*; TER*

Notes: Biogeographical Realm: Nearctic

***Hoplandrothrips consobrinus* (Knechtel, 1951)**

- <http://azoresbiportal.uac.pt/azores-species/hoplandrothrips-consobrinus-8371/>

Native status: Introduced

Distribution: SJG*; TER; SMG

Notes: Also present: MAD; CAN (Biogeographical Realm: Palearctic)

***Hoplothrips corticis* (De Geer, 1773)**

- <http://azoresbiportal.uac.pt/azores-species/hoplothrips-corticis-7086/>

Native status: Native

Distribution: FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Biogeographical Realm: Cosmopolitan

***Hoplothrips ulmi* (Fabricius, 1781)**

- <http://azoresbiportal.uac.pt/azores-species/hoplothrips-ulmi-8382/>

Native status: Introduced

Distribution: FLO*; FAI; SJG*; TER; SMG*

Notes: Also present: MAD (Biogeographical Realm: Palearctic)

***Nesothrips propinquus* (Bagnall, 1916)**

- <http://azoresbiportal.uac.pt/azores-species/nesothrips-propinquus-8383/>

Native status: Introduced

Distribution: FAI; PIC; SJG; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Cosmopolitan)

Family Thripidae

Aptinothrips rufus Haliday, 1836

- <http://azoresbiportal.uac.pt/azores-species/aptinothrips-rufus-8365/>

Native status: Introduced

Distribution: FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Cosmopolitan)

Ceratothrips ericae (Haliday, 1836)

- <http://azoresbiportal.uac.pt/azores-species/ceratothrips-ericae-8366/>

Native status: Native

Distribution: FAI; PIC; SJG; TER; SMG; SMR

Notes: Also present: MAD (Biogeographical Realm: Holarctic)

Heliothrips haemorrhoidalis (Bouché, 1833)

- <http://azoresbiportal.uac.pt/azores-species/heliothrips-haemorrhoidalis-7080/>

Native status: Introduced

Distribution: FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD; CAN; CVP (Biogeographical Realm: Cosmopolitan)

Hercinothrips bicinctus (Bagnall, 1919)

- <http://azoresbiportal.uac.pt/azores-species/hercinothrips-bicinctus-7092/>

Native status: Introduced

Distribution: FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Cosmopolitan)

Isoneurothrips australis Bagnall, 1915

- <http://azoresbiportal.uac.pt/azores-species/isoneurothrips-australis-8387/>

Native status: Introduced

Distribution: TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Cosmopolitan)

***Thrips atratus* Haliday, 1836**

- <http://azoresbiportal.uac.pt/azores-species/thrips-atratus-8392/>

Native status: Native

Distribution: FAI; PIC; SJG; TER; SMG; SMR

Notes: Also present: MAD (Biogeographical Realm: Holarctic)

***Thrips flavus* Schrank, 1776**

- <http://azoresbiportal.uac.pt/azores-species/thrips-flavus-8394/>

Native status: Native

Distribution: FAI; PIC; SJG; TER; SMG; SMR

Notes: Also present: MAD (Biogeographical Realm: Holarctic)

Order Neuroptera

Family Hemerobiidae

***Hemerobius azoricus* Tjeder, 1948**

- <http://azoresbiportal.uac.pt/azores-species/hemerobius-azoricus-6862/>

Native status: Azores endemic

Distribution: FLO*; FAI*; PIC; GRA; SJG; TER*; SMG; SMR

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

Order Coleoptera

Family Anobiidae

***Anobium punctatum* (De Gueer, 1774)**

- <http://azoresbiportal.uac.pt/azores-species/anobium-punctatum-7571/>

Native status: Introduced

Distribution: COR; FLO; FAI; PIC; GRA; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Western Palearctic)

Family Brentidae

Aspidapion radiolus subsp. chalybeipenne (Wollaston, 1854)

- <http://azoresbiportal.uac.pt/azores-species/aspidapion-radiolus-chalybeipenne-13444/>

Native status: Native

Distribution: COR; FLO; FAI; SJG; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Palearctic)

Family Carabidae

Acupalpus dubius Schilsky, 1888

- <http://azoresbiportal.uac.pt/azores-species/acupalpus-dubius-7371/>

Native status: Native

Distribution: FLO; FAI; GRA; SJG*; TER; SMG; SMR

Notes: Also present: MAD (Biogeographical Realm: Western Palearctic)

Acupalpus flavicollis (Sturm, 1825)

- <http://azoresbiportal.uac.pt/azores-species/acupalpus-flavicollis-7306/>

Native status: Native

Distribution: FAI*; TER

Notes: Biogeographical Realm: Palearctic

Amara aenea (De Geer, 1774)

- <http://azoresbiportal.uac.pt/azores-species/amara-aenea-7366/>

Native status: Introduced

Distribution: COR; FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD; CAN; CVP (Biogeographical Realm: Holarctic)

***Anisodactylus binotatus* (Fabricius, 1787)**

- <http://azoresbiportal.uac.pt/azores-species/anisodactylus-binotatus-7367/>

Native status: Introduced

Distribution: COR; FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD (Biogeographical Realm: Holarctic)

***Calathus lundbladi* Colas, 1938**

- <http://azoresbiportal.uac.pt/azores-species/calathus-lundbladi-7354/>

Native status: Azores endemic

Distribution: SMG

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

***Cedrorum azoricus subsp. azoricus* Borges & Serrano, 1993**

- <http://azoresbiportal.uac.pt/azores-species/cedrorum-azoricus-azoricus-13442/>

Native status: Azores endemic

Distribution: TER; SMR

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

***Cedrorum azoricus subsp. caveirensis* Borges & Serrano, 1993**

- <http://azoresbiportal.uac.pt/azores-species/cedrorum-azoricus-caveirensis-13453/>

Native status: Azores endemic

Distribution: PIC

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

***Laemostenus complanatus* (Dejean, 1828)**

- <http://azoresbiportal.uac.pt/azores-species/laemostenus-complanatus-7362/>

Native status: Introduced

Distribution: FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Cosmopolitan)

***Ocys harpaloides* (Audinet-Serville, 1821)**

- <http://azoresbioportal.uac.pt/azores-species/ocys-harpaloides-7335/>

Native status: Native

Distribution: COR; FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD (Biogeographical Realm: Western Palearctic)

***Paranchus albipes* (Fabricius, 1796)**

- <http://azoresbioportal.uac.pt/azores-species/paranchus-albipes-7350/>

Native status: Introduced

Distribution: COR; FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Holarctic)

***Pseudanchomenus aptinoides* Tarnier, 1860**

- <http://azoresbioportal.uac.pt/azores-species/pseudanchomenus-aptinoides-6831/>

Native status: Azores endemic

Distribution: PIC; SMG

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

***Pseudoophonus rufipes* De Geer, 1774**

- <http://azoresbioportal.uac.pt/azores-species/pseudoophonus-rufipes-7373/>

Native status: Introduced

Distribution: COR; FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD (Biogeographical Realm: Western Palearctic)

***Pterostichus aterrimus* subsp. *aterrimus* (Herbst, 1784)**

- <http://azoresbioportal.uac.pt/azores-species/pterostichus-aterrimus-aterrimus-13452/>

Native status: Native

Distribution: PIC*; SJG; TER

Notes: Also present: MAD (Biogeographical Realm: Palearctic)

***Pterostichus vernalis* (Panzer, 1796)**

- <http://azoresbioportal.uac.pt/azores-species/pterostichus-vernalis-7348/>

Native status: Introduced

Distribution: FAI; PIC; GRA; SJG; TER; SMG

Notes: Biogeographical Realm: Palearctic

***Stenolophus teutonius* (Schrank, 1781)**

- <http://azoresbioportal.uac.pt/azores-species/stenolophus-teutonius-7368/>

Native status: Native

Distribution: COR; FLO; FAI; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Western Palearctic)

***Trechus terrabravensis* Borges, Serrano & Amorim, 2004**

- <http://azoresbioportal.uac.pt/azores-species/trechus-terrabravensis-7345/>

Native status: Azores endemic

Distribution: TER

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

Family Cerambycidae***Crotchiella brachyptera* Israelson, 1985**

- <http://azoresbioportal.uac.pt/azores-species/crotchiella-brachyptera-7879/>

Native status: Azores endemic

Distribution: PIC; TER; SMG; SMR

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

Family Chrysomelidae***Chaetocnema hortensis* (Fourcroy , 1785)**

- <http://azoresbioportal.uac.pt/azores-species/chaetocnema-hortensis-7888/>

Native status: Introduced

Distribution: FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD (Biogeographical Realm: Western Palearctic)

***Epitrix hirtipennis* (Melsheimer, 1847)**

- <http://azoresbiportal.uac.pt/azores-species/epitrix-hirtipennis-7886/>

Native status: Introduced

Distribution: PIC; GRA; TER; SMG; SMR

Notes: Biogeographical Realm: Nearctic

***Psylliodes marcidus* (Illiger, 1807)**

- <http://azoresbiportal.uac.pt/azores-species/psylliodes-marcidus-7916/>

Native status: Native

Distribution: FLO; FAI; PIC; GRA; TER; SMG; SMR

Notes: Also present: MAD (Biogeographical Realm: Palearctic)

Family Ciidae

***Atlantocis gillerforsi* Israelson, 1986**

- <http://azoresbiportal.uac.pt/azores-species/atlantocis-gillerforsi-7674/>

Native status: Azores endemic

Distribution: FLO; PIC; TER*; SMG; SMR

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

Family Coccinellidae

***Clitostethus arcuatus* (Rossi, 1794)**

- <http://azoresbiportal.uac.pt/azores-species/clitostethus-arcuatus-7638/>

Native status: Introduced

Distribution: GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Western Palearctic)

***Coccinella undecimpunctata subsp. undecimpunctata* Linnaeus, 1758**

- <http://azoresbiportal.uac.pt/azores-species/coccinella-undecimpunctata-undecimpunctata-13471/>

Native status: Introduced

Distribution: COR; FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Biogeographical Realm: Holarctic

***Lindorus lophanthae* (Blaisdell, 1892)**

- <http://azoresbiportal.uac.pt/azores-species/lindorus-lophanthae-7649/>

Native status: Introduced

Distribution: FLO; GRA; SJG*; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Cosmopolitan)

***Rodolia cardinalis* (Mulsant, 1850)**

- <http://azoresbiportal.uac.pt/azores-species/rodolia-cardinalis-7648/>

Native status: Introduced

Distribution: COR; FLO; PIC; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD; CAN; CVP (Biogeographical Realm: Cosmopolitan)

Family Corylophidae***Sericoderus lateralis* (Gyllenhal, 1827)**

- <http://azoresbiportal.uac.pt/azores-species/sericoderus-lateralis-7672/>

Native status: Introduced

Distribution: COR; FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD; CAN; CVP (Biogeographical Realm: Palearctic)

Family Curculionidae***Calacalles subcarinatus* (Israelson, 1984)**

- <http://azoresbiportal.uac.pt/azores-species/calacalles-subcarinatus-6896/>

Native status: Azores endemic

Distribution: COR; FLO; FAI*; PIC; GRA; SJG*; TER; SMG; SMR

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

***Caulotrupis parvus* Israelson, 1985**

- <http://azoresbiportal.uac.pt/azores-species/caulotrupis-parvus-7942/>

Native status: Azores endemic

Distribution: SMR

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

***Coccotrypes carpophagus* (Hornung, 1842)**

- <http://azoresbiportal.uac.pt/azores-species/coccotrypes-carpophagus-7872/>

Native status: Introduced

Distribution: FAI; PIC*; GRA; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Cosmopolitan)

***Drouetius borgesii* subsp. *borgesii* Machado, 2009**

- <http://azoresbiportal.uac.pt/azores-species/drouetius-borgesii-borgesii-13569/>

Native status: Azores endemic

Distribution: TER

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

***Drouetius borgesii* subsp. *centralis* Machado, 2009**

- <http://azoresbiportal.uac.pt/azores-species/drouetius-borgesii-centralis-13568/>

Native status: Azores endemic

Distribution: FAI; PIC; GRA; SJG

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

***Drouetius borgesii* subsp. *sanctmichaelis* Machado, 2009**

- <http://azoresbiportal.uac.pt/azores-species/drouetius-borgesii-sanctmichaelis-13566/>

Native status: Azores endemic

Distribution: SMG

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

***Gymnetron pascuorum* (Gyllenhal, 1813)**

- <http://azoresbiportal.uac.pt/azores-species/gymnetron-pascuorum-7951/>

Native status: Introduced

Distribution: FAI; TER; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Western Palearctic)

***Orthochaetes insignis* (Aubé, 1863)**

- <http://azoresbiportal.uac.pt/azores-species/orthochaetes-insignis-7946/>

Native status: Native

Distribution: FLO; FAI*; TER; SMR

Notes: Biogeographical Realm: Palearctic

***Otiorhynchus cribricollis* Gyllenhal, 1834**

- <http://azoresbiportal.uac.pt/azores-species/otiorhynchus-cribricollis-7907/>

Native status: Introduced

Distribution: COR; FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Western Palearctic)

***Otiorhynchus rugosostriatus* (Goeze, 1777)**

- <http://azoresbiportal.uac.pt/azores-species/otiorhynchus-rugosostriatus-7912/>

Native status: Introduced

Distribution: FLO*; FAI; PIC; SJG*; TER; SMG; SMR

Notes: Also present: MAD (Biogeographical Realm: Palearctic)

***Phloeosinus gillerforsi* Bright, 1987**

- <http://azoresbiportal.uac.pt/azores-species/phloeosinus-gillerforsi-7163/>

Native status: Azores endemic

Distribution: FLO; PIC; SJG*; TER*; SMG

Notes: Also present: CAN (Biogeographical Realm: Western Palearctic (Macaronesia))

***Pseudechinosoma nodosum* Hustache, 1936**

- <http://azoresbiportal.uac.pt/azores-species/pseudechinosoma-nodosum-6827/>

Native status: Azores endemic

Distribution: FLO; FAI*; PIC; SJG*; TER*; SMG; SMR

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

***Pseudophloeophagus aenopiceus* (Boheman, 1845)**

- <http://azoresbiportal.uac.pt/azores-species/pseudophloeophagus-aenopiceus-7949/>

Native status: Native

Distribution: FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD (Biogeographical Realm: Palearctic)

***Pseudophloeophagus tenax* Wollaston, 1854**

- <http://azoresbiportal.uac.pt/azores-species/pseudophloeophagus-tenax-7094/>

Native status: Native

Distribution: COR; FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD (Biogeographical Realm: Western Palearctic (Macaronesia))

***Sitona discoideus* Gyllenhal, 1834**

- <http://azoresbiportal.uac.pt/azores-species/sitona-discoideus-7925/>

Native status: Introduced

Distribution: FLO; FAI; GRA; SJG; TER*; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Palearctic)

***Xyleborinus alni* Nijima, 1909**

- <http://azoresbiportal.uac.pt/azores-species/xyleborinus-alni-7920/>

Native status: Introduced

Distribution: FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD (Biogeographical Realm: Holarctic)

Family Dryophthoridae

Sitophilus oryzae (Linnaeus, 1763)

- <http://azoresbiportal.uac.pt/azores-species/sitophilus-oryzae-7910/>

Native status: Introduced

Distribution: FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD; CAN; CVP (Biogeographical Realm: Cosmopolitan)

Family Dryopidae

Dryops algericus (Lucas, 1846)

- <http://azoresbiportal.uac.pt/azores-species/dryops-algericus-7545/>

Native status: Native

Distribution: FLO; TER; SMG; SMR

Notes: Biogeographical Realm: Palearctic

Dryops luridus (Erichson, 1847)

- <http://azoresbiportal.uac.pt/azores-species/dryops-luridus-7546/>

Native status: Native

Distribution: COR; FLO; FAI*; GRA; TER*; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Palearctic)

Family Dytiscidae

Agabus bipustulatus (Linnaeus, 1767)

- <http://azoresbiportal.uac.pt/azores-species/agabus-bipustulatus-7393/>

Native status: Native

Distribution: FLO; PIC; SJG; TER

Notes: Also present: MAD (Biogeographical Realm: Palearctic)

***Agabus godmani* Crotch, 1867**

- <http://azoresbioportal.uac.pt/azores-species/agabus-godmani-7395/>

Native status: Azores endemic

Distribution: FLO; FAI; PIC; GRA; SJG; TER; SMG

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

***Hydroporus guernei* Régimbart, 1891**

- <http://azoresbioportal.uac.pt/azores-species/hydroporus-guernei-7411/>

Native status: Azores endemic

Distribution: COR; FLO; FAI; PIC; SJG; TER; SMG; SMR

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

Family Elateridae

***Aeolus melliculus subsp. moreleti* Tarnier, 1860**

- <http://azoresbioportal.uac.pt/azores-species/aeolus-melliculus-moreleti-13463/>

Native status: Introduced

Distribution: FLO; FAI; GRA; SJG; TER; SMG; SMR

Notes: Biogeographical Realm: Neotropical

***Alestrus dolosus* (Crotch, 1867)**

- <http://azoresbioportal.uac.pt/azores-species/alestrus-dolosus-7551/>

Native status: Azores endemic

Distribution: FLO; FAI*; PIC*; TER; SMG; SMR

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

***Athous pomboi* Platia & Borges, 2002**

- <http://azoresbioportal.uac.pt/azores-species/athous-pomboi-6826/>

Native status: Azores endemic

Distribution: SMR

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

Family Hydrophilidae

Cercyon haemorrhoidalis (Fabricius, 1775)

- <http://azoresbioportal.uac.pt/azores-species/cercyon-haemorrhoidalis-7400/>

Native status: Introduced

Distribution: FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Biogeographical Realm: Holarctic

Family Lathridiidae

Cartodere bifasciata Reitter, 1877

- <http://azoresbioportal.uac.pt/azores-species/cartodere-bifasciata-7673/>

Native status: Introduced

Distribution: FAI; GRA; TER*; SMG; SMR

Notes: Also present: MAD (Biogeographical Realm: Cosmopolitan)

Cartodere nodifer (Westwood, 1839)

- <http://azoresbioportal.uac.pt/azores-species/cartodere-nodifer-7165/>

Native status: Introduced

Distribution: FLO; FAI; PIC; GRA; SJG*; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Cosmopolitan)

Cartodere satelles (Blackburn, 1888)

- <http://azoresbioportal.uac.pt/azores-species/cartodere-satelles-9639/>

Native status: Introduced

Distribution: TER*; SMR*

Notes: Also present: MAD (Biogeographical Realm: Cosmopolitan)

***Metophtalmus occidentalis* Israelson, 1984**

- <http://azoresbiportal.uac.pt/azores-species/metophtalmus-occidentalis-7663/>

Native status: Azores endemic

Distribution: FAI; GRA; SMG; SMR

Notes: Biogeographical Realm: Cosmopolitan

Family Leiodidae***Catops coracinus* Kellner, 1846**

- <http://azoresbiportal.uac.pt/azores-species/catops-coracinus-7091/>

Native status: Native

Distribution: FAI*; GRA; SJG*; TER*; SMG*

Notes: Biogeographical Realm: Cosmopolitan

Family Monotomidae***Rhizophagus ferrugineus* (Paykull, 1800)**

- <http://azoresbiportal.uac.pt/azores-species/rhizophagus-ferrugineus-7068/>

Native status: Introduced

Distribution: TER*

Notes: Also present: CAN (Biogeographical Realm: Cosmopolitan)

Family Mycetophagidae***Typhaea stercorea* (Linnaeus, 1758)**

- <http://azoresbiportal.uac.pt/azores-species/typhaea-stercorea-7676/>

Native status: Introduced

Distribution: FLO; FAI; PIC; GRA; TER; SMG; SMR

Notes: Also present: MAD; CAN; CVP (Biogeographical Realm: Cosmopolitan)

Family Nitidulidae

Carpophilus fumatus (Boheman, 1851)

- <http://azoresbiportal.uac.pt/azores-species/carpophilus-fumatus-7562/>

Native status: Introduced

Distribution: COR; FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD; CVP (Biogeographical Realm: Cosmopolitan)

Carpophilus hemipterus (Linnaeus, 1758)

- <http://azoresbiportal.uac.pt/azores-species/carpophilus-hemipterus-7580/>

Native status: Introduced

Distribution: FAI; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD; CAN; CVP (Biogeographical Realm: Cosmopolitan)

Epuraea biguttata (Thunberg, 1784)

- <http://azoresbiportal.uac.pt/azores-species/epuraea-biguttata-7616/>

Native status: Introduced

Distribution: FLO*; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Palearctic)

Meligethes aeneus (Fabricius, 1775)

- <http://azoresbiportal.uac.pt/azores-species/meligethes-aeneus-7606/>

Native status: Introduced

Distribution: FLO; FAI; PIC; SJG; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Holarctic)

Stelidota geminata (Say, 1825)

- <http://azoresbiportal.uac.pt/azores-species/stelidota-geminata-7618/>

Native status: Introduced

Distribution: FLO; FAI*; PIC*; GRA; SJG*; TER*; SMR*

Notes: Biogeographical Realm: Neotropical

Family Phalacridae

Stilbus testaceus (Panzer, 1797)

- <http://azoresbioportal.uac.pt/azores-species/stilbus-testaceus-7480/>

Native status: Native

Distribution: FLO; FAI; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Western Palearctic)

Family Ptiliidae

Ptenidium pusillum (Gyllenhal, 1808)

- <http://azoresbioportal.uac.pt/azores-species/ptenidium-pusillum-7320/>

Native status: Introduced

Distribution: FLO; FAI; PIC; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Cosmopolitan)

Family Scarabaeidae

Onthophagus taurus (Schreber, 1759)

- <http://azoresbioportal.uac.pt/azores-species/onthophagus-taurus-7532/>

Native status: Introduced

Distribution: COR; FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Biogeographical Realm: Palearctic

Family Scraptiidae

Anaspis proteus Wollaston, 1854

- <http://azoresbioportal.uac.pt/azores-species/anaspis-proteus-7855/>

Native status: Native

Distribution: COR; FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Western Palearctic (Macaronesia))

Family Silvanidae

Cryptamorpha desjardinsii (Guérin-Ménéville, 1844)

- <http://azoresbioportal.uac.pt/azores-species/cryptamorpha-desjardinsii-7620/>

Native status: Introduced

Distribution: COR; FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Western Palearctic)

Order Trichoptera

Family Limnephilidae

Limnephilus atlanticus Nybom, 1948

- <http://azoresbioportal.uac.pt/azores-species/limnephilus-atlanticus-8582/>

Native status: Azores endemic

Distribution: COR; FLO*; FAI; PIC*; SJG; TER*; SMG*

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

Order Lepidoptera

Family Crambidae

Eudonia luteusalis (Hampson, 1907)

- <http://azoresbioportal.uac.pt/azores-species/eudonia-luteusalis-8816/>

Native status: Azores endemic

Distribution: FLO; FAI; PIC; SJG; TER; SMG; SMR

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

Scoparia coecimaculalis Warren, 1905

- <http://azoresbioportal.uac.pt/azores-species/scoparia-coecimaculalis-8821/>

Native status: Azores endemic

Distribution: FLO*; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

***Scoparia semiampalis* Warren, 1905**

- <http://azoresbiportal.uac.pt/azores-species/scoparia-semiampalis-8822/>

Native status: Azores endemic

Distribution: FLO; FAI; PIC; SJG; TER; SMG; SMR

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

Family Gelechiidae

***Brachmia infuscatella* Rebel, 1940**

- <http://azoresbiportal.uac.pt/azores-species/brachmia-infuscatella-8738/>

Native status: Azores endemic

Distribution: FAI; PIC; SJG; TER; SMR*

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

Family Geometridae

***Ascotis fortunata* subsp. *azorica* Pinker, 1971**

- <http://azoresbiportal.uac.pt/azores-species/ascotis-fortunata-azorica-13542/>

Native status: Azores endemic

Distribution: COR; FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

***Cyclophora azorensis* (Prout, 1920)**

- <http://azoresbiportal.uac.pt/azores-species/cyclophora-azorensis-8745/>

Native status: Azores endemic

Distribution: COR; FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

***Cyclophora puppillaria subsp. granti* (Prout, 1935)**

- <http://azoresbioportal.uac.pt/azores-species/cyclophora-puppillaria-granti-13543/>

Native status: Azores endemic

Distribution: SMR

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

***Nycterosea obstipata* (Fabricius, 1794)**

- <http://azoresbioportal.uac.pt/azores-species/nycterosea-obstipata-8749/>

Native status: Native

Distribution: FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD; CAN; CVP (Biogeographical Realm: Cosmopolitan)

***Xanthorhoe inaequata* Warren, 1905**

- <http://azoresbioportal.uac.pt/azores-species/xanthorhoe-inaequata-8750/>

Native status: Azores endemic

Distribution: COR; FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

Family Gracillariidae***Caloptilia schinella* (Walsingham, 1908)**

- <http://azoresbioportal.uac.pt/azores-species/caloptilia-schinella-8753/>

Native status: Introduced

Distribution: COR; FAI; PIC; SJG; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Cosmopolitan)

***Micrurapteryx bistrigella* (Rebel, 1940)**

- <http://azoresbioportal.uac.pt/azores-species/micrurapteryx-bistrigella-8754/>

Native status: Azores endemic

Distribution: FLO; PIC; SJG; TER*

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

***Phyllocnistis citrella* Stainton, 1856**

- <http://azoresbiportal.uac.pt/azores-species/phyllocnistis-citrella-8759/>

Native status: Introduced

Distribution: FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Cosmopolitan)

Family Noctuidae

***Agrotis ipsilon* (Hufnagel, 1766)**

- <http://azoresbiportal.uac.pt/azores-species/agrotis-ipsilon-8763/>

Native status: Native

Distribution: COR; FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD; CAN; CVP (Biogeographical Realm: Cosmopolitan)

***Autographa gamma* (Linnaeus, 1758)**

- <http://azoresbiportal.uac.pt/azores-species/autographa-gamma-8765/>

Native status: Native

Distribution: COR; FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Palearctic)

***Chrysodeixis chalcites* (Esper, 1789)**

- <http://azoresbiportal.uac.pt/azores-species/chrysodeixis-chalcites-8766/>

Native status: Native

Distribution: COR; FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD; CAN; CVP (Biogeographical Realm: Western Palearctic)

***Mesapamea storai* (Rebel, 1940)**

- <http://azoresbiportal.uac.pt/azores-species/mesapamea-storai-8778/>

Native status: Azores endemic

Distribution: COR; FLO; FAI; PIC; GRA; SJG; TER; SMG

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

***Mythimna unipuncta* (Haworth, 1809)**

- <http://azoresbioportal.uac.pt/azores-species/mythimna-unipuncta-8780/>

Native status: Native

Distribution: COR; FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD; CAN (Biogeographical Realm: Cosmopolitan)

***Phlogophora interrupta* (Warren, 1905)**

- <http://azoresbioportal.uac.pt/azores-species/phlogophora-interrupta-8761/>

Native status: Azores endemic

Distribution: FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

***Xestia c-nigrum* (Linnaeus, 1758)**

- <http://azoresbioportal.uac.pt/azores-species/xestia-c-nigrum-8792/>

Native status: Native

Distribution: COR; FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Also present: MAD (Biogeographical Realm: Holarctic)

Family Nymphalidae

***Hipparchia azorina subsp. occidentalis* (Sousa, 1985)**

- <http://azoresbioportal.uac.pt/azores-species/hipparchia-azorina-occidentalis-13545/>

Native status: Azores endemic

Distribution: COR; FLO

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

***Hipparchia miguelensis* (Le Cerf, 1935)**

- <http://azoresbioportal.uac.pt/azores-species/hipparchia-miguelensis-8798/>

Native status: Azores endemic

Distribution: SMG

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

Family Tineidae

Oinophila v-flava (Haworth, 1828)

- <http://azoresbiportal.uac.pt/azores-species/oinophila-v-flava-8833/>

Native status: Introduced

Distribution: FLO; FAI; PIC*; TER; SMG

Notes: Also present: MAD; CAN (Biogeographical Realm: Palearctic)

Opogona sacchari (Bojer, 1856)

- <http://azoresbiportal.uac.pt/azores-species/opogona-sacchari-8838/>

Native status: Introduced

Distribution: COR; FAI; PIC; GRA; SJG*; TER; SMG; SMR

Notes: Also present: MAD; CAN; CVP (Biogeographical Realm: Cosmopolitan)

Family Tortricidae

Rhopobota naevana (Hübner, 1817)

- <http://azoresbiportal.uac.pt/azores-species/rhopobota-naevana-8858/>

Native status: Introduced

Distribution: FLO*; FAI*; PIC; GRA; SJG*; TER*; SMG*; SMR*

Notes: Biogeographical Realm: Holarctic

Family Yponomeutidae

Argyresthia atlanticella Rebel, 1940

- <http://azoresbiportal.uac.pt/azores-species/argyresthia-atlanticella-8859/>

Native status: Azores endemic

Distribution: COR; FLO; FAI; PIC; GRA; SJG; TER; SMG; SMR

Notes: Biogeographical Realm: Western Palearctic (Macaronesia)

Analysis

Azorean Arthropod biodiversity - towards a more complete knowledge

The ultimate goal of biodiversity assessments is documenting all species inhabiting a region. However, this has often proven impossible to achieve given the unfeasibility of collecting every single species that exists in a study area. This study focuses on the terrestrial arthropod diversity of the Azores and encompasses most orders of the phylum Arthropoda. A pool of a total of 1215 species and subspecies was surveyed, representing 53% of the whole arthropod fauna known from the Azores (Borges et al. 2010). By deliberately not surveying Crustacea, Acari, Collembola, Diptera and Hymenoptera, we excluded 47% of the archipelago's species pool. Yet, this study added 10 endemic and at least 16 other species, mostly exotics, to the known Azorean arthropod fauna. More will be added soon after the on-going revision of Staphylinidae (in prep.) and Zopheridae (Borges et al. 2016, in press). Overall, at least 26 species that occur in native forests were added to the Azorean arthropod fauna list. The new 346 taxonomic records provided by this study (see Suppl. material 4 for the complete list of new records per island) represent on average an increase in species number of about 10% for each studied island (Table 2). However, the increment for São Jorge island was about 22%, while for São Miguel this represented only 3% (Table 2). 164 species were found in new islands, with an average of two islands per species. For 82 of those species only one new island was added to their known distribution contrasting with 27 species for which four or more islands were added (Fig. 2). Notably, nine out of the 27 species with more than three island added to their previous distribution belong to Arachnida. In fact, arachnids but also millipedes and centipedes experienced a large proportion of new records (more than 30%) (see Table 3).

Table 2.				
Species richness for the Azores archipelago and each island. Total currently known species, the number of species surveyed during this study and those that represent new records are presented.				
	Known species in the Azores	Pool of surveyed taxa	New records	New records (%)
AZORES	2316	1215	26	2.13
FLO	797	461	55	11.93
FAI	945	537	51	9.49
PIC	808	463	46	9.93
SJG	620	359	76	21.17
TER	1224	731	52	7.11
SMG	1592	861	28	3.25
SMR	799	573	38	6.63

Table 3.

Total species and subspecies records for the Azores, new species and subspecies records during this study and increment for the most speciose classes and orders. Values for all islands are added, so richness may be up to 7 times higher than the archipelago's richness (as 7 islands were surveyed). (*)The Coleoptera families Staphylinidae and Zopheridae were not considered (see text).

	Total records	New records	New Records (%)
Class Arachnida	362	124	34.25
Order Pseudoscorpiones	19	5	26.32
Order Opiliones	12	11	91.67
Order Araneae	331	108	32.63
Class Diplopoda	67	24	35.82
Order Polydesmida	18	8	44.44
Order Polyxenida	0	0	0.00
Order Julida	44	12	27.77
Order Chordeumatida	5	4	80.00
Class Chilopoda	21	9	42.86
Order Scutigromorpha	0	0	0.00
Order Lithobiomorpha	7	0	0.00
Order Scolopendromorpha	4	2	50.00
Order Geophilomorpha	10	7	70.00
Class Insecta	1012	189	18.68
Order Microcoryphia	13	4	30.77
Order Zygentoma	0	0	0.00
Order Ephemeroptera	6	0	0.00
Order Odonata	0	0	0.00
Order Blattaria	7	3	42.86
Order Orthoptera	10	0	0.00
Order Phasmatodea	0	0	0.00
Order Dermaptera	14	0	0.00
Order Psocoptera	75	40	53.33
Order Thysanoptera	76	6	7.89
Order Hemiptera	290	82	28.28
Order Neuroptera	7	3	42.86
Order Coleoptera (*)	361	36	9.97
Order Trichoptera	6	4	66.67
Order Lepidoptera	147	11	7.84

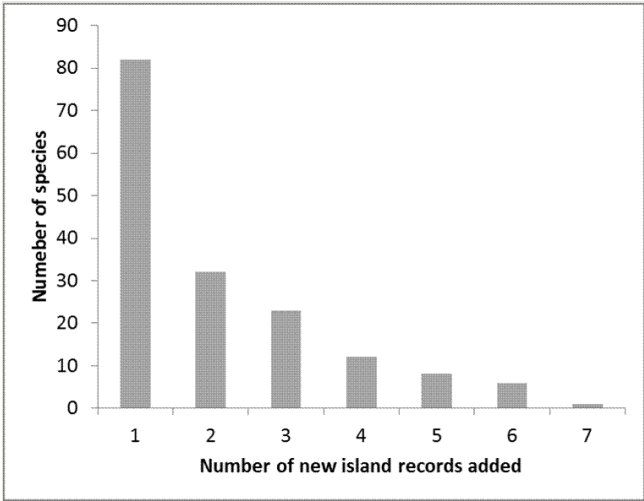


Figure 2.
Frequency distribution of the number of new island records per species.

The number of species identified for each of the 18 native forest fragments surveyed is shown in Fig. 3. The fragment with the highest species diversity is Serra de Santa Bárbara in Terceira island ($S = 124$), which is also the larger native forest area in the Azores. Remarkably, one of the smallest fragments, Pico Alto in Santa Maria island, is the second most diverse ($S = 121$).

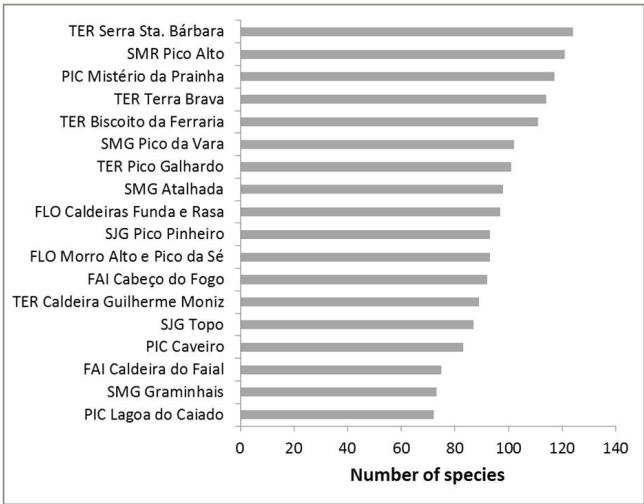


Figure 3.
Number of species per native forest fragments. Island codes as in Table 1

BALA2 samples only added 4% of species to the previous BALA survey (Fig. 4). Interestingly, 59 samples collected in the first two years of survey (1999 and 2000) provided about 81% of the total species recorded in this study.

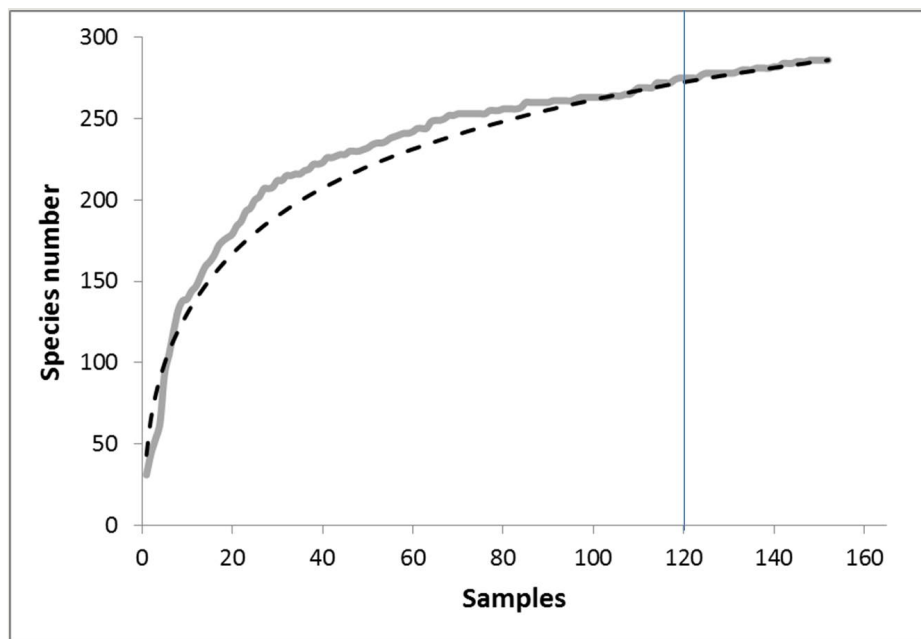


Figure 4.

Species accumulation curve for the 286 species of arthropods collected in 152 pitfall and beating samples between 1999 and 2011. The solid line corresponds to the chronological sample sequence and the dotted line is a randomized curve (1000 runs). Samples to the left of the vertical line were collected in BALA1 and to the right in BALA2.

The most abundant species

A total of 163744 individuals were identified as belonging to the 286 species (see Suppl. material 5 for the complete list of abundance per species). The ten most abundant species (Fig. 5) accommodate 56% of the total number of individuals and include mostly indigenous species (endemic or native non-endemic). The single introduced species is the millipede *Ommatoiulus moreletii* (Fig. 6). With exception of the millipede *Ommatoiulus moreletii*, the centipede *Lithobius pilicornis pilicornis* and the opilion *Leiobunum blackwalli* (Fig. 7) that are mostly soil epigeal species, the other seven species live preferentially in the canopies of Azorean endemic trees. The moth *Argyresthia atlanticella* (Fig. 8) is particularly common in *Juniperus brevifolia* and *Erica azorica*; the spider *Savigniorrhhipis acoreensis* (Fig. 9) is particularly abundant in *Juniperus brevifolia*, but can also be found in other plants

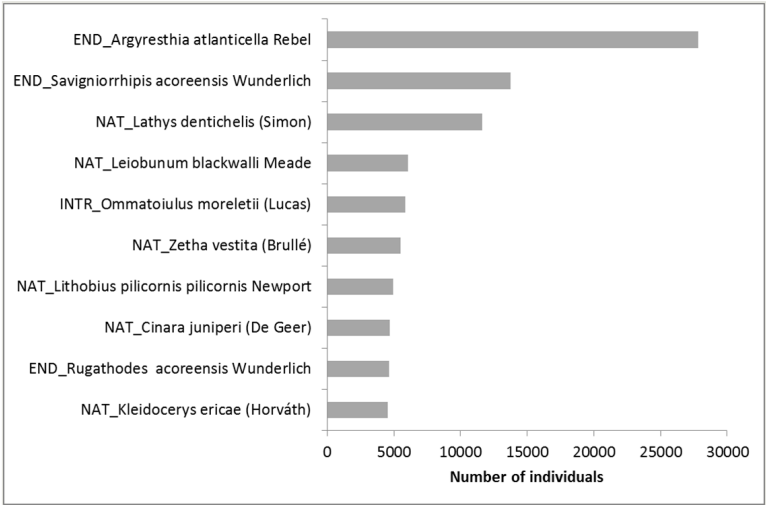


Figure 5.

The ten most abundant species in the database. END - endemic from Azores; NAT - native non-endemic species; INTR - species introduced in the archipelago.



Figure 6.

The millipede *Ommatoiulus moreletii* (Credit: Pedro Cardoso)



Figure 7.

The opilion *Leiobunum blackwalli* (Credit: Paulo A.V. Borges).



Figure 8.

The moth *Argyroresthia atlanticella* (Credit: Paulo A.V. Borges)



Figure 9.

The spider *Savigniorrhypis acoreensis* (Credit: Paulo A.V. Borges)

Discussion

Cardoso et al. (2011) identified seven impediments in invertebrate conservation. Three of them are particularly relevant for our study: most species are undescribed (the Linnean shortfall), the distribution of described species is mostly unknown (the Wallacean shortfall), and the abundance of species and its variation in space and time are unknown (the Prestonian shortfall). We argue that with the BALA project we were able to contribute to overcome some of these impediments in the Azores. In fact, we show that as a result of the standardized sampling performed in Azorean native forests we were able to: i) decrease the Linnean shortfall, by increasing the number of described Azorean endemics (e.g. Blas and Borges 1999, Ribes and Borges 2001, Platia and Borges 2002, Quartau and Borges 2003, Borges et al. 2004, Borges and Wunderlich 2008, Crespo et al. 2013, Crespo et al. 2014, Borges et al. 2016); ii) decrease the Wallacean shortfall, by increasing the known distribution of many endemic and exotic species in the archipelago (e.g. Borges et al. 2005a, Borges et al. 2006, Cardoso et al. 2009, Meijer et al. 2011); and iii) decrease the Prestonian shortfall, by using standardized sampling, which allowed the comparison of species abundances in space and time as many of the same sites were sampled in two different time periods.

The increase in the number of islands from where each species is known and the distribution increase for many species within each island shows the importance of regional standardized surveys, which provided a major improvement in the knowledge of the distribution of arthropod species in the native forests of the Azores.

The fact that most diversity was captured during the first two years of the project reflects the importance of sampling a wide geographic range covering all the islands and the

maximum number of sites. Increasing the number of samples per fragment (sampling performed in 2004) or replicating the sampling at a different time (29 sites in 2010 to 2011; [BALA2](#) project) had a lesser impact in increasing our knowledge about biodiversity (Fig. 4).

The future agenda for surveying and monitoring Azorean arthropod biodiversity includes:

- a) expanding the standardized survey of Azorean arthropods to other habitat types, mostly man-modified, an already on-going task for some of the islands (see e.g. Cardoso et al. 2009, Meijer et al. 2011, Cardoso et al. 2013, Florencio et al. 2013, Santos et al. 2010);
- b) selecting study areas along a comprehensive environmental gradient where an optimal sampling strategy will be applied in order to sample the entire arthropod communities (All Taxa Biodiversity Inventory - ATBI). ATBIs are intensive sampling efforts to identify and record all living species that exist within a given area and simultaneously create a common and standardized biodiversity database (Lawton and Gaston 2001);
- c) finishing the identification of many morphospecies. Good progress has been made with Staphylinidae (Borges et al. in prep.), but other taxa need further effort to reach proper identification;
- d) increase sampling and update the current list of Azorean Hymenoptera and Diptera, which is clearly incomplete (Borges et al. 2010). The shortage of taxonomists who can adequately identify species (i.e. the so-called *Taxonomic Impediment*) has prevented advances in the knowledge for many diverse groups in the Azores, including these two.
- e) contributing to the validation and updating of the pan-European checklists programs, including [Fauna Europaea](#) (Jong et al. 2014) and [PESI](#) (Jong et al. 2015) allowing a more general evaluation and comparison of species distributions and statuses.

This study advances the knowledge on the unique arthropod biodiversity of the Azores, but at the same time highlights the need for further surveys. We strongly believe that the [BALA](#) project will stimulate further research and conservation actions towards the preservation of Azorean biodiversity. Furthermore, we hope that all the taxa yet to be identified will entice taxonomist to join us in the endeavour of cataloguing all terrestrial arthropods of the most remote of the Macaronesian archipelagos, the Azores. The ongoing longterm research projects in Azores and the recent creation of the E-Repository [ISLANDLAB](#) will create new opportunities for biodiversity studies in Azores.

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Author contributions

PAVB, ARMS, JQ and KAT conceived the ideas; PAVB, CG, LC, FR, PC, FP, CR, IRA, CM, CA, GA, SPR, JH, AMCS, ABS, JW, JAQ, ARMS and KAT obtained samples; PAVB, CG, EM and LB prepared the databases; PAVB, LC, PC, HE, FI, VM, MTP, JR, AB, ABS, Rzs, VV, JW, JAQ and ARMS performed taxonomic work and identified species; PAVB led the writing with substantial input from the other authors.

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Supplementary materials

Suppl. material 1: Appendix 1 - Detailed data on the distribution and abundance of the studied species

Authors: Borges et al.

Data type: Occurrences and abundance

Brief description: Detailed data on the occurrences and abundances of the studied species. Data on species abundance in each individual sample (pitfall trap or canopy beating) for the 152 transects in eighteen protected areas and seven Azorean islands.

Filename: Appendix 1_Main Database.xlsx - [Download file](#) (5.78 MB)

Suppl. material 2: Appendix 2 - Metadata from Appendix 1

Authors: Borges et al.

Data type: Text in pdf

Brief description: METADATA from Appendix 1 – Detailed data on the distribution and abundance of the studied species

Filename: Supplementary Material 2_Metadata.pdf - [Download file](#) (203.42 kb)

Suppl. material 3: Appendix 3 - Sites UTM coordinates

Authors: Borges et al.

Data type: Sites coordinates

Brief description: UTM coordinates (regions 25S for Flores and 26S for all other islands), altitude (meters) and supporting project of the studied transects in the Azores. Transect code according to island, reserve and transect number (see text)

Filename: Appendix_Sites.xlsx - [Download file](#) (12.70 kb)

Suppl. material 4: Appendix 4. Complete list of new records per island.

Authors: Borges et al.

Data type: Occurrences

Brief description: The complete list of new records per island.

Filename: Appendix 4_New records.xlsx - [Download file](#) (29.50 kb)

Suppl. material 5: Appendix 5 -Abundance data

Authors: Borges et al.

Data type: Abundance data

Brief description: Detailed abundance for each species in each of the 18 protected areas

Filename: Appendix 5_Species abundances in detail.xlsx - [Download file](#) (28.93 kb)